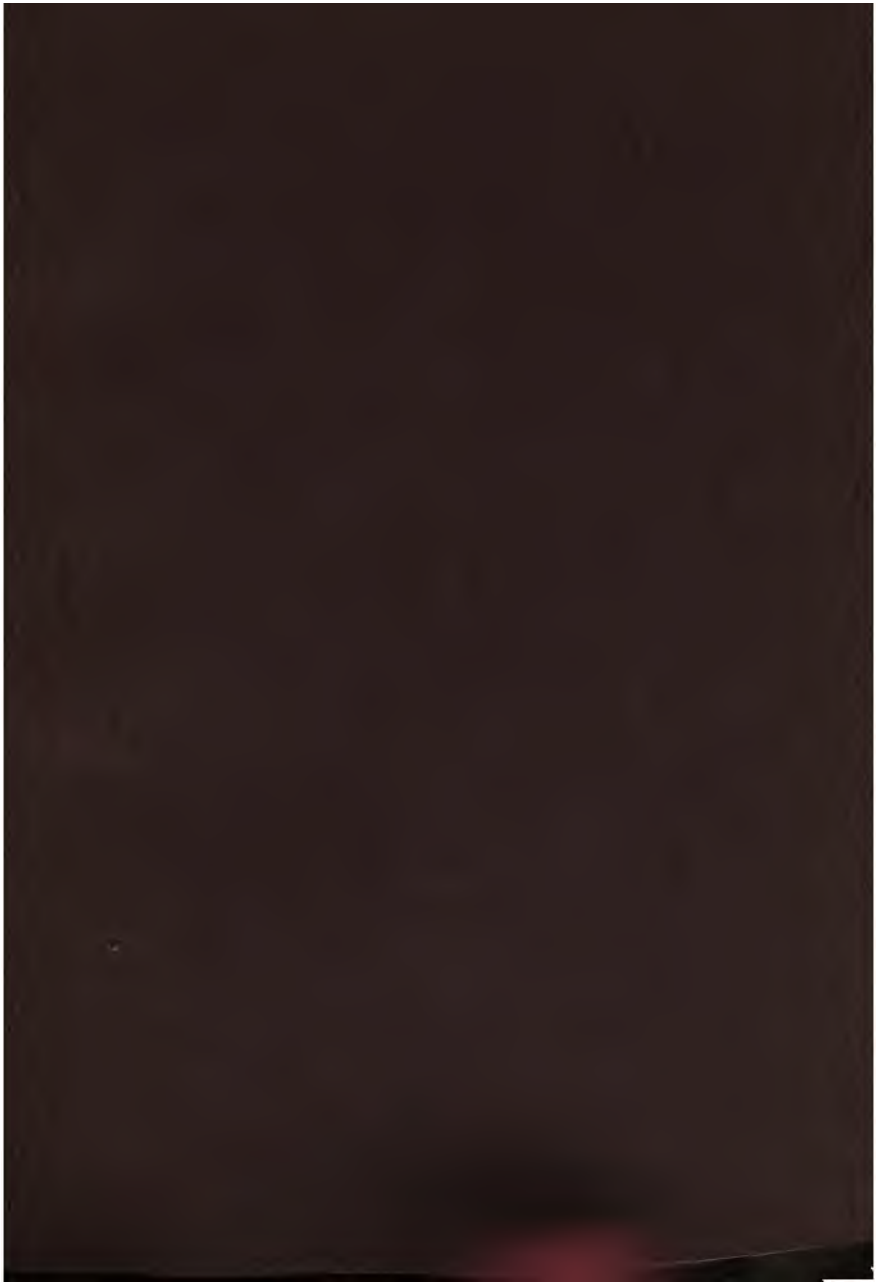
Medical Epitome Series

NOSE AND THROAT

FERGUSON

PEDERSEN



The Medical Epitome Series.

DISEASES

OF THE

NOSE AND THROAT.

BY

J. BRUCE FERGUSON, M.D.,

Instructor in Diseases of the Nose and Throat in the Postgraduate Medical School and Hospital, New York.

SERIES EDITED BY

VICTOR COX PEDERSEN, A.M., M.D.,

Lecturer in Surgery at the New York Polyclinic Medical School and Hospital; Genitourinary Surgeon to the Outpatient Departments of the New York and Hudson Street Hospitals; Anesthetist to the Roosevelt Hospital.

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AUTHOR'S PREFACE.

THE object of this short work is to present in concise and practical form, the diagnosis and treatment of the various diseases ordinarily found in the nose and throat.

While it may appear superficial to the specialist in these diseases, it is hoped that it will prove helpful to the undergraduate and the post-graduate medical student who wishes to become familiar with the fundamental principles of nose and throat work in a short time, and also to both in listening to lectures or in doing special dispensary work.

It is also hoped that this work may be acceptable as a brief reference-book to the general practitioner, who is often called upon to treat diseases of the nose and throat, and who needs to have in a concise form the chief points in the diagnosis and treatment of any of the diseases ordinarily found in these parts of the respiratory system. Very little reference has been made to pathology or anatomy, because in so short a work it is almost impossible to do justice to these branches, and it is better that the student should refer to some of the special works for this information.

The author wishes to express his indebtedness to the works of MacDonald, Cohen, Bosworth, Sajous, Kyle, and Knight, and also to writers in the medical journals, too numerous to mention.

J. B. F.

New York, 1906.

EDITOR'S PREFACE.

In arranging for the editorship of *The Medical Epitome Series* the publishers established a few simple conditions, namely, that the Series as a whole should embrace the entire realm of medicine; that the individual volumes should authoritatively cover their respective subjects in all essentials; and that the maximum amount of information, in letter-press and engravings, should be given for a minimum price. It was the belief of the publishers and editor alike that brief works of high character would render valuable service not only to students, but also to practitioners who might wish to refresh or supplement their knowledge to date.

To the authors the editor extends his heartiest thanks for their excellent work. They have fully justified his choice in inviting them to undertake a kind of literary task which is always difficult—namely, the combination of brevity, clearness, and comprehensiveness. They have equalled the conscientious efforts with which the editor has performed his duties from first to last. Co-operation of this kind ought to result in useful books, in brief manuals as contradistinguished from mere compends.

In order to render the volumes suitable for quizzing, and yet preserve the continuity of the text unbroken, the questions have been gathered at the end of each chapter. This new arrangement, it is hoped, will be convenient alike to students and practitioners.

V. C. P.

New York, 1906.

CONTENTS.

DISEASES OF THE NOSE AND THROAT.

CHAPTER I.

GENERAL CONSIDERATIONS.

Essentials of History and Examination.—In order to be successful in the treatment of diseases of the nose and throat it is particularly necessary that the student should make himself familiar with, and dexterous in, the use of the various instruments necessary for making examinations and carrying out treatments. This may only be accomplished by a great deal of patience and experience in clinical work.

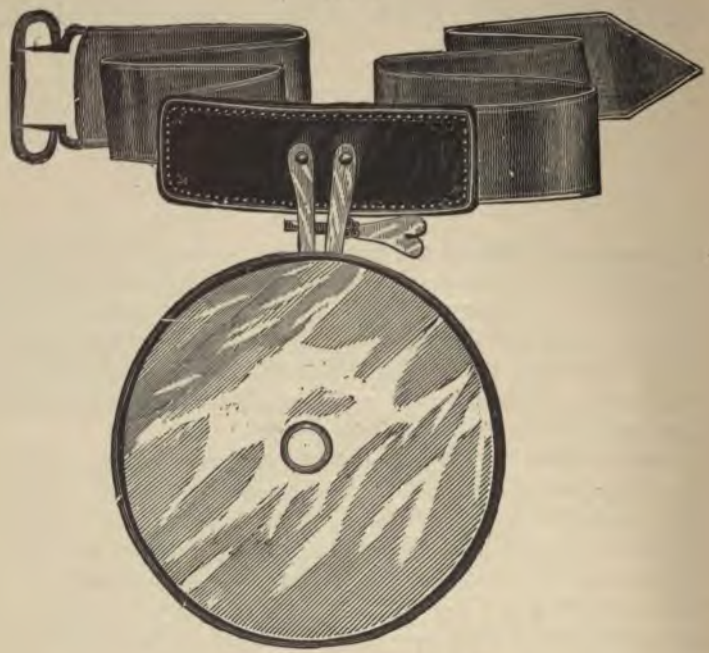
Patients' first impressions are often very much influenced by the surroundings and general appearance of the doctor's office, the appliances for examination, the cleanliness and neatness of the instruments, and especially by the gentleness and thoroughness of the examination. When a patient comes to one's office let him give a short **history of the disease** in order to find out exactly what is the special pain or discomfort of which he complains. When the examination begins, the part which chiefly troubles him should always be investigated first. Before making a **diagnosis**, or stating a **positive opinion**, always make a careful examination of the nostrils, pharnyx, postnasal space, and larnyx. When the exact condition of all these parts is known, one is able to tell the patient what is found and what the suggestions as to treatment are.

The **instruments and fixtures** necessary for ordinary work are described hereinafter, and the special instruments, as occasions present themselves, will be discussed later.

The first appliance necessary is a **head mirror** or reflector,

(Fig. 1) which should be of concave glass from three to four

FIG. 1.

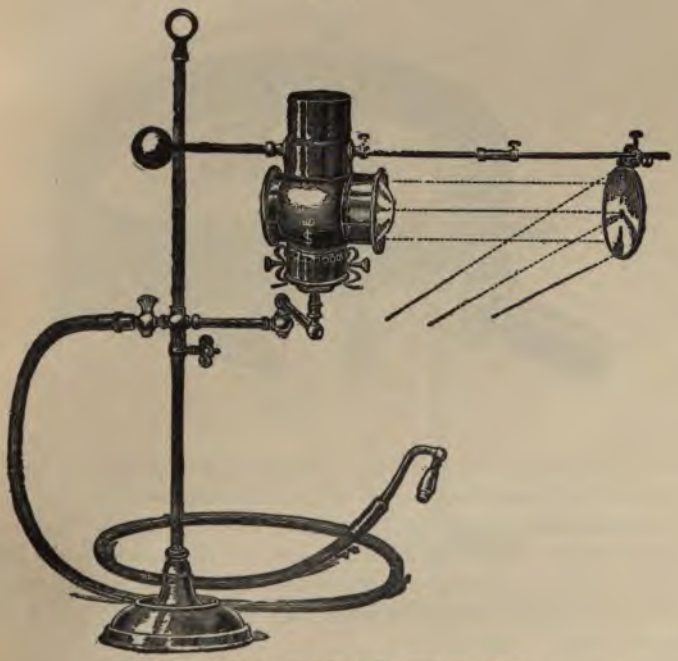


Head mirror with leather band.

inches in diameter. For ordinary work, a mirror with a leather head-band and ball-and-socket joint is to be preferred, so that, when not in use, it may be turned upward on the forehead out of the way. For office work a mirror attached to the lamp is more convenient in a great many ways (Fig. 2). There is another reflector, a combination of source of light and mirror, in the form of a small electric lamp, with lenses and reflector (Fig. 3). This may be used in office work, but it is especially useful for bedside exam-

inations, enabling one to get a good view of the patient's nose or throat without disturbing him in any way.

FIG. 2.



Arm and gas-burner with reflector attached.

The reflector is usually worn over the eye on the side from which the light comes; that is, if the lamp is at the left side, one should wear the head-mirror over the left eye. This is, moreover, the more practical side, there being less danger of obstruction of view while operating.

The **best light** is a gas-burner provided with a Welsbach mantle and condenser, as shown in the cut. Some men prefer electricity, using a 32-candle-power bulb behind the same

form of condenser. The only objection to the electric light is, that it is necessary to have an alcohol lamp burning in order to

Fig. 3.

Electric head-light.

heat the diagnostic mirrors. Another good source of light is the ordinary students' lamp with a condenser (Fig. 4).

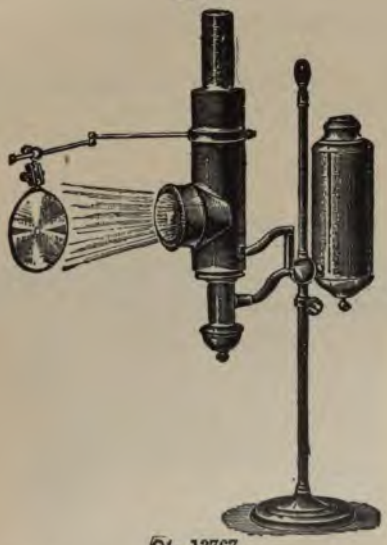
Nasal Speculum.—Illustrations of two are given; they are very simple, are easily applied, and are the most serviceable. There are many other good nasal specula, any of which will answer all requirements for the examination of the nose (Figs. 5 and 6).

There are many different kinds of **tongue-depressor**, but the single-piece varieties, such as is shown in Fig. 7, are preferable, especially those that are not fenestrated (Fig. 8). It is always well to have a number of depressors, as no patient likes to have one that he thinks some one else has been using a short time previously (Fig. 9).

Five or six **laryngeal-mirrors** are necessary, using the larger ones to examine the larynx and the smaller ones to examine the postnasal space. The small ones might be called **rhinoscopic mirrors.** These mirrors are easily damaged by excessive

heat; it is always necessary to warm them over the alcohol- or gas-lamp each time before using, in order to prevent the breath of the patient from clouding the mirror. This heating

FIG. 4.



Students' lamp with condenser and reflector attached.

FIG. 5.

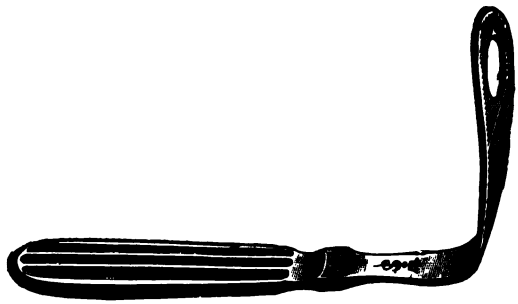
Rice's nasal speculum.

FIG. 6.

Myles' nasal speculum.

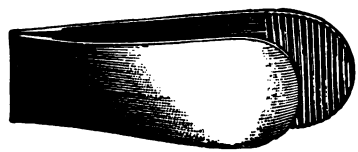
must be done carefully or the mirror is destroyed. Before using them in the mouth always try the degree of heat on the hand, so that the mirror be not too hot and burn the patient's

FIG. 7.



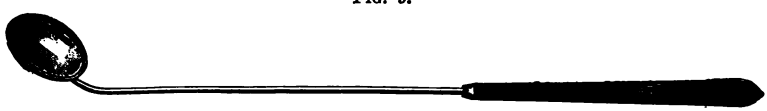
Bosworth's tongue-depressor.

FIG. 8.



Tobold's folding tongue-depressor.

FIG. 9.



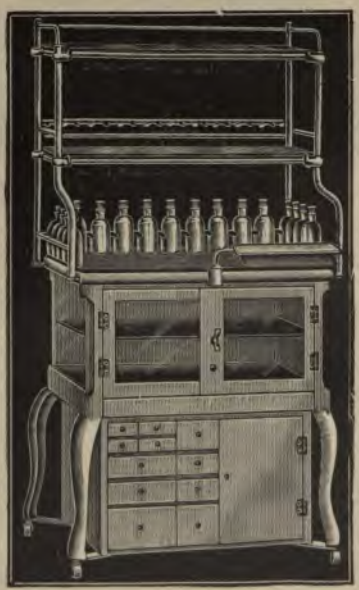
Laryngeal mirror.

mouth. The handles in all possible cases should be nickle-plated, as they appear more attractive, are aseptic, and may be sterilized when necessary.

Several **applicators** are indispensable—short ones for the nose and long ones for the pharynx and larynx. These applicators are made of nickle-plated steel-wire having a screw or corrugated tip, in order that the cotton may not slip off in using. The laryngeal applicators should be curved almost to a right angle at one end, having the short limb two or three inches long.

Other **special instruments** will be referred to from time to time as description of them may be required for the different operations (Fig. 10).

Fig. 10.



Metal and glass office cabinet for nose and throat work.

The **operating-room** should always be neat and clean, and contain a glass-top operating-table, several glass trays for in-

struments, and a small sterilizer—similar to that shown in Fig. 11. There is a very efficient electric sterilizer, which takes up little space and is especially serviceable for nose and throat instruments.

Fig. 11.

Small sterilizer.

The accompanying illustration of an **operating-chair** shows a very good type, both for the patient and operator (Fig. 12). The operator also requires a large supply of **clean towels**, a **basket for soiled towels**, and a **receptacle for soiled dressings**. An ordinary paper bag, hung out of the patient's sight, is a most sanitary receptacle for dressings, because, when it is full, its mouth is twisted shut, and the bag thus closed is removed to be burned. Thus no one need touch the soiled cotton and dressings of the office.

The **compressed air for the spray tubes and wash bottles** is important. There are many ways of obtaining the pressure necessary. The hand compressor shown in Fig. 13 is the best cheap one to be had. Its only disadvantage is that the pump has to be worked often, and considerable strength is required

to produce much pressure. There are very reliable triplex water-power pumps, which are not expensive to run and give

Fig. 12.

Convenient office chair.

very good satisfaction. The author has in his cellar a large forty-gallon air-tank which is kept at a constant pressure of twenty-five pounds by an automatic electric air-pump. This he has found to be the best pump in the market at the present time (Fig. 14). From the large supply-tank in the cellar, different supply tubes should run to the operating room One tube, fitted with a cut-off, supplies air for the spray-bottles, atomizers, and such wash-bottles as may be required. Another tube passes to the nebulizer. As many other tubes as might be needed may be connected to the large tank.

The **spray-tubes** are made of glass, hard rubber, or nickle-plated metal tubing. The objection to glass tubes is that they

FIG. 13.

Compressed-air outfit with hand pump and spray-tubes.

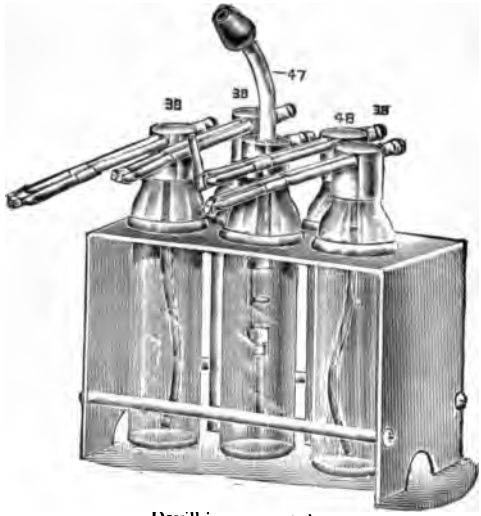
break very easily. The hard-rubber tubes are apt to become stopped up at times, and frequently are damaged by boiling for sterilization. The author prefers the nickle-plated tubes, as they are more durable and may be sterilized by boiling when required (Fig. 15). It is always well to have a series

FIG. 14.

Electric force pump for compressed air apparatus.

of these spray-tubes and bottles—two for oil solutions and others for alumnol solution, cocaine solution and any other solutions which might be required from time to time. Fig. 16 illustrates a very serviceable spray outfit that has the advantage of an electric attachment which enables one to have all the solutions warm, even making some of them hot if required.

FIG. 15.



Devilbiss spray-tubes.

FIG. 16.

Devilbiss electric heater for spray-tubes.

CHAPTER II.

DISEASES OF THE NOSE.

Physiology of the Nose.—The nose is the organ of the special sense of smell; but it is essentially an organ of respiration, warming and moistening the air we breathe and arresting particles of dust in the air before they enter the lungs. The breathing of air at an uneven temperature, or of marked degree of dryness, or if saturated or laden with impurities, always acts as a source of irritation to the mucous membrane of the upper respiratory tract. It has been shown that no matter how cold the external air may be, by the time it reaches the pharynx it has become almost as warm as the blood, and also well saturated with moisture. The mucous membrane lining the nose, and especially that over the lower turbinate bone, secretes from sixteen to twenty ounces of fluid during the twenty-four hours. The action of this fluid is to cleanse and lubricate the nose and to moisten the air one breathes. Conditions may arise which interfere with this natural secretion of the nose, either by increasing the amount of fluid elements so that it flows out of the nostrils as a thin, watery discharge, (noticed in an acute cold in the head or acute coryza), or, on the other hand, by decreasing the fluid elements so that the secretion becomes too thick to flow away. This is due to the fact that some of the glands have become atrophied and the secretion thickened, and, collecting in the nose, decomposes and forms scabs and crusts in the nostrils. Under these conditions the patient will often complain of a dropping of mucous into the throat. This condition is usually only a collection of secretions from the nose, which, being too thick to flow away, collect in the postnasal space, and when a certain amount has accumulated it drops into the pharynx. Breathing through the nose is very essential to good health, and breathing through the mouth so injurious that many

artificial methods are employed to moisten and warm the air by people who thus breathe. The quality of the voice is much influenced by the size and shape of the nasal chambers and by any abnormal condition of these chambers such as deviation of the septum, spurs on the septum, enlarged turbinated bones, in fact anything which interferes with the free passage of air through the nose has a more or less injurious effect upon the voice, and, by correcting these abnormal features, the voice is much improved in quality. We notice this dead quality or lack of resonance in the voice very markedly in people whose nostrils are obstructed by polypi or whose postnasal space is filled by adenoids.

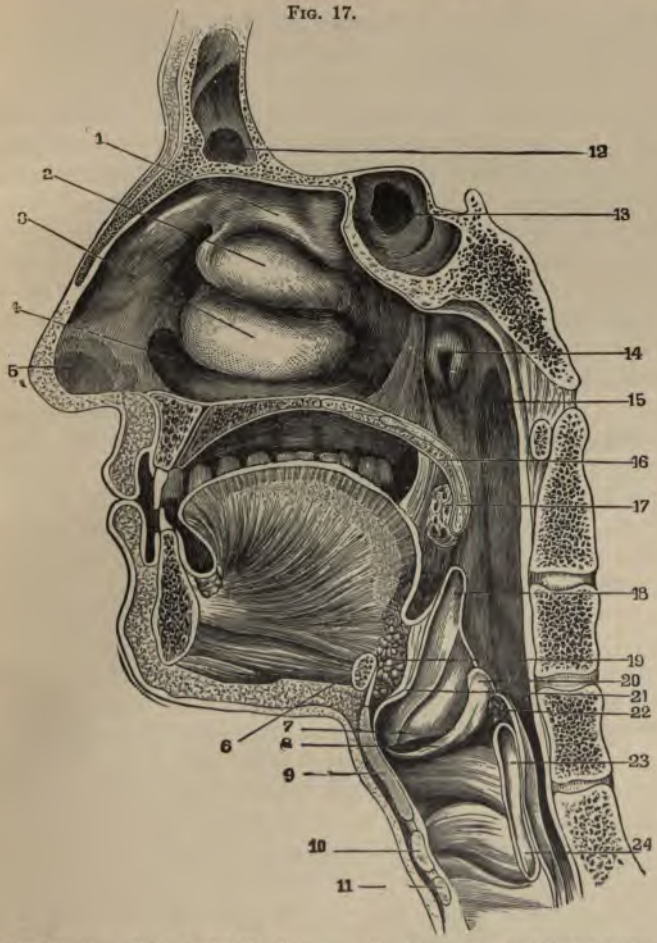
Anatomy of the Nose.—The nose is divided by a median partition, the septum, into two **nasal chambers** (**fossæ**) each one being a wedge-shaped cavity, distinct by itself and extending from the nostril or anterior nares in front to the posterior nares or postnasal space behind, and from the base of the skull above to the hard palate below.

The **septum of the nose** is a thin partition, a tenth- to an eighth-inch in thickness, and is composed in front of cartilage and behind of bone. The bony part is made up by the perpendicular plate of the ethmoid, the vomer, and the nasal spine of the frontal bone. In its normal condition the septum should be perfectly straight, thin, and in the median line. The cartilaginous portion is seldom found in this condition, as, owing to its prominent position and frequent exposure to injury by blows and falling on the nose, the septum is often bent or deviated to one side or the other to so marked a degree in some cases as to occlude the nostril. The posterior part is composed of bone, and, being well protected from violence, is seldom found in any displaced position even when the cartilaginous portion is often badly deformed.

The **outer wall of the nasal cavity** is formed by the inner surface of the maxillary, the lachrymal, the ethmoid, and the palate bone.

The **roof of the nose** is formed by the nasal bone, the nasal

FIG. 17.



Vertical Section of Head, slightly diagrammatic: 1, superior turbinated bone; 2, middle turbinated bone; 3, lower turbinated bone; 4, floor of nasal cavity; 5, vestibule; 6, section of hyoid bone; 7, ventricular band; 8, vocal cord; 9 and 23, section of thyroid cartilage; 10 and 24, section of cricoid cartilage; 11, section of first tracheal ring; 12, frontal sinus; 13, sphenoidal cells; 14, pharyngeal opening of Eustachian tube; 15, Rosenmuller's groove; 16, velum palati; 17, tonsil; 18, epiglottis; 19, adipose tissue behind tongue; 20, arytenoid cartilage; 21, tubercle of epiglottis; 22, section of arytenoid muscle. (Seiler.)

spine of the frontal, the cribriform plate of the ethmoid, and the body of the sphenoid bone (Fig. 17).

The **floor of the nose** is formed by the superior maxillary and palate bone. The outer wall of the nose is the most complicated, and presents three prominences, the turbinate bones, which extend from before backward and partially divide the nasal cavity into incomplete spaces called meatus. These turbinated bodies are three in number—the inferior, middle, and superior. They vary in size and shape, and, owing to the relations they bear to the surrounding parts, and to the influence they exert on the general condition of the nose and throat, are of great importance.

The **inferior** or **lower turbinate bone** is the largest, and, in a way, is the only independent bone. The **middle** and **superior turbinate bones** are smaller. All are concave in shape and extend from before backward, and beneath the concave surface of each one the corresponding meatus is found.

The **inferior meatus** is that portion of the nasal passage which lies below the inferior turbinate bone and extends from the nostril in front to the postnasal space behind. Opening into the inferior meatus is the **nasal duct**, which carries the secretions from the lachrymal sac.

The **middle meatus** lies above the inferior turbinate bone and below the middle turbinate bone, and opening into it are passages from the **antrum of Highmore**, the **frontal sinus** and the **anterior ethmoidal cells**. The largest of these openings into the meatus is the one from the antrum, (sometimes called **ostium maxillare**), and is found just beneath the centre of the middle turbinate bone. The opening of the frontal sinus is located at the anterior end of the middle turbinate bone, and a little posterior to it the opening of the ethmoidal cells is found.

The **superior meatus** is situated above the middle turbinate bone, and it has opening into it a passage for the **posterior ethmoidal cells** and the **sphenoidal sinus**, from before backward, in the order named.

The **accessory cavities of the nose** are: the **maxillary sinus** or **antrum of Highmore**, the **frontal sinus**, the **anterior ethmoidal sinuses** (which are three in number), and the **posterior ethmoidal sinus**. The only purpose of these various cavities is to add strength and lightness to the bones of the head.

The **mucous membrane lining the nasal cavities** is called the **Schneiderian membrane**, and is continuous through the ducts with the mucosa of all the various accessory cavities of the nose. In the upper part, over the superior turbinate bone and septum, it it quite thin, while over the lower turbinate bone, the floor of the nose, and the lower part of the septum, it is quite thick and closely adherent to the periosteum. It is well supplied with bloodvessels and nerves, which accounts for the rapid repair after injury or operation.

The mucous membrane is covered with ciliated epithelium, and contains numerous secreting glands.

The **nerves of the nasal cavity** are important. The **olfactory nerve** passes through the cribriform plate of the ethmoid bone and is distributed to the upper part of the septum and to the superior and middle turbinated bodies. The **sensory nerves** are derived from the fifth cranial nerves. The nasal branch of the **ophthalmic** and the **Vidian nerves** supply the roof of the nose. The outer wall receives branches from the **anterior dental nerve, palatine nerve**, and also from the **sphenopalatine ganglion**. The septum is supplied by branches from the **nasal, nasopalatine**, and **Vidian nerves**.

Arterial Blood Supply of the Nose.—The anterior and posterior ethmoidal branches of the **ophthalmic artery** supply the roof of the nose, all the ethmoidal cells, and the frontal sinus. Branches of the **internal maxillary artery** supply the septum, turbinated bodies, and meatus. The **posterior dental artery** supplies the antrum. The external part of the nose and skin are supplied by the **ophthalmic, facial, infraorbital**, and by branches of the **internal maxillary arteries**.

The **veins of the nose** join, through the foramina in the cribriform plate, the **intracranial vein**.

Rhinoscopy comprises the act of examining the nasal cavities. It may be divided into two forms, **anterior rhinoscopy** (right and left), and **posterior rhinoscopy.**

Essentials of Rhinoscopy.—In order to perform rhinoscopy properly it is necessary to have a good light—either sun-light or gas-light. The patient sits on one chair with the light at the level of the eyes, and preferably at his right side. The examiner sits in front with the head-mirror over the left eye. In examining a patient one should always make him sit comfortably, with the head level, (that is, not tilted upward or toward either side).

FIG. 18.

Hartman's uvula retractor.

Anterior Rhinoscopy.—With the nasal speculum in the right hand the examiner opens the nostril. He should look first at the **condition of the mucous membrane**—whether congested, pale, very dry, or covered with mucus. He should notice the **septum**—as to its general thickness, any deviation to either side, spurs, exostosis, or ulceration. He must inspect the **lower turbinate bone** as to its size—whether enlarged or atrophied. After this the head of the patient is raised a little and examination made of the **middle turbinate bone**, which should be small and prominent, but should not be in contact with the septum or outer wall of the nose. If there be a polypus it will be found in this locality. If there should be ethmoidal disease, a little pus would be noticed flowing downward over the anterior end of the middle turbinate bone. The other nostril should be examined in the same manner. If there is evidence of frontal, ethmoidal or antral disease, it will be necessary to continue the examination, using diagnostic lamps and other instruments.

These details will be taken up especially when describing diseases of the accessory cavities.

After examining the anterior nares, one is ready to begin the examination of the **posterior nares** (**posterior rhinoscopy**). For this purpose the following are the **necessary instruments**: a **small mirror** (number one or two of the laryngeal set) and a **tongue-depressor**; and in some cases it will be necessary to use a **palate retractor** or **palate hook** (Fig. 18). The tongue-depressor is held in the left hand and placed upon the

FIG. 19.

Rhinoscopic image.

1, Vomer or nasal septum; 2, floor of the nose; 3, superior meatus; 4, middle meatus 5, superior turbinated bone; 6, middle turbinated bone; 7, inferior turbinated bone; 8, pharyngeal orifice of Eustachian tube; 9, upper portion of Rosenmuller's groove; 10, glandular tissue at the anterior portion of the vault of pharynx; 11, posterior portion of velum (Seiler).

dorsum of the tongue. The patient is requested to breathe quietly through the nose and to let the tongue and soft palate be perfectly relaxed. A small rhinoscopic mirror, slightly heated, is now carefully inserted behind the soft palate, taking care not to touch the uvula or back of the pharynx with the mirror.

Anatomic Points of Posterior Rhinoscopy.—The **vault** or **upper part of the pharynx** is inspected for any thickened tissue or

adenoids; then the **septum**, which should be thin and vertically in the median line. On either side of the septum the **posterior ends of the lower and middle turbinate bones** (and in some rare cases the **superior turbinate bone**) are seen. The mirror is deflected a little to either side and the **opening of the Eustachian tube** is brought into view. In cases that are nervous or hold the head awkwardly, it will be difficult to see these parts well. It will then be necessary to use a two per cent. solution of cocaine on the soft palate and to pull the palate gently forward with a palate hook, when a full view of the posterior nasal structures will be obtained (Fig. 19).

RHINITIS.

Definition.—Rhinitis is an inflammation of the mucous membrane lining the nasal passages.

Forms.—Rhinitis may be divided for the convenience of description into **acute, chronic, atrophic,** and **hypertrophic rhinitis.** These types may again be subdivided into other varieties, if necessary; but usually these four divisions will comprise all the clinical cases usually encountered.

ACUTE RHINITIS.

Synonyms.—Coryza, cold in the head, acute nasal catarrh.

Definition.—Acute rhinitis is an acute inflammation of the mucous membrane lining the nose.

Etiology.—Exposure to cold or wet when the body is overheated; sitting in a draught; exposure to sudden or extreme changes in the atmosphere; the inhalation of irritating fumes or dust; foreign bodies in the nose; certain drugs, such as iodides and ipecac. It may also be excited by certain gastric and intestinal diseases and a neurotic tendancy. The predisposing cause is a depressed general condition of the health.

Symptoms.—There is a feeling of chilliness, aching of the limbs, tendency to sneeze, severe frontal headache, dry eyes,

itchy sensation, and a "stopped up" feeling in the nostrils. There is a thin, watery, very irritating discharge from the nose, which, at first is very thin, becomes thicker, more tenacious, and, in time, of mucopurulent character. Tinnitus aurium, with a marked impairment of hearing, is often a prominent sympton.

Physical Examination.—The nose is swollen, the mucous membrane is red and congested, respiration is impeded, and the inflammation very often has extended to the eyes and through the Eustachian tubes to the ears.

The **diagnosis** is usually made easily. It is only necessary to exclude **acute exanthemata, foreign bodies** and **tumors** of the nose.

The **prognosis** in a simple case is usually favorable, the attack lasting from three to eight days. Acute rhinitis leaves certain changes in the tissues which increase the tendency to recurrent attacks and permanent damage.

The **treatment of acute rhinitis** should be prophylactic, abortive, and curative, depending considerably on the cause.

Prophylaxis consists in protecting a subject of tendencies toward rhinitis from the well-known causes in general, and from causes which in his own case may be especially important.

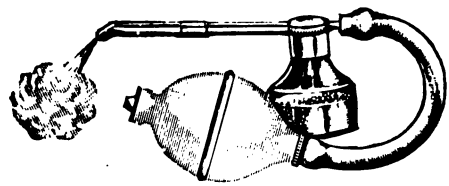
Abortive Measures.—If the patient is seen during the first few hours, he should be given a very hot mustard foot-bath and at once put to bed. A Dover's powder, with a hot drink, followed by an active cathartic a few hours later, is of benefit. He should also be given plenty of water and lemonade; the diet should be light. If the discharge is thin and acid, and at the same time the mucous membrane much swollen, the author prefers to use a one per cent. or two per cent. solution of cocaine to open the nostrils by blanching the mucosa, and then to have the patient use some antiseptic powder, such as compound stearate of zinc and boric acid, to be insufflated by means of a powder-blower into each nostril every hour for six or eight hours. Tell the patient not to blow the nose at the same time. Another serviceable coryza powder is the following:

℞.

Cocaine	gr. ii.
Camphor	gr. iii.
Menthol	gr. iii.
Compound stearate of zinc and boric acid	āā ʒ i.

Mix, and make a powder.
S.—Blow into the nose with the blower every hour, as directed.

Fig. 20.



Devilbiss powder blower.

If the patient is very nervous, potassium bromide; if rheumatic, salicylate of soda; and if malarial, quinine is indicated. Cocaine, while it gives temporary relief, should seldom be used, and should never be given to the patient except as prescribed in the coryza powder. If the discharge is a little thick, good results are often obtained by using an oil-spray every hour or two, such as—

℞.

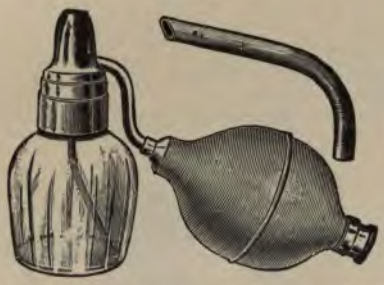
Menthol	gr. vi.
Chloroform	♏ v.
Camphor	gr. v.
Liquid albolene	ʒ ii.

Mix, and make into a solution.
S.—Use in an oil atomizer every two hours.

In later cases when the patient comes with the nasal mucosa swollen so that he cannot breathe, eyes swollen and congested, and a general feeling of stuffiness in the head, the best curative treatment is the following: In each nostril insert a little four per cent. cocaine solution on cotton and leave it in for five minutes. This will shrink the tissues and for the time relieve the congestion. When the cotton has been removed,

wash each nostril out gently with a mild alkaline solution such as warm Seiler's solution (half-strength), or one teaspoonful of glycothymolin, borolyptol, or alkalithymoformal in a half-

Fig. 21.



Oil atomizer with a long tube for spraying the larynx.

glass of warm water. After the nostrils have been cleansed employ a mild oil-spray and have the patient use it at home at short intervals. The following is a good formula:

℞.
Cocaine . . . . . gr. v.
Almond oil
Liquid vaseline . . . . . āā ℥ i.
Mix, and make a solution.
S.—Spray into the nose frequently.

In a few cases the inhalation of vapors is very beneficial, making the vapors with a nebulizer—

℞.
Menthol
Camphor . . . . . āā gr. v.
Compound tincture of benzoin . . . . ℥ i.
Liquid albolene up to . . . . . ℥ i.
Mix, and make a solution.
S.—Use in a nebulizer frequently.

At home the patient should take one rhinitis tablet every hour for ten or twelve doses, or, in intense cases, one every

half-hour until the belladonna causes a dryness of the throat, after which one tablet is to be taken every three or four hours. Very good results may be obtained by giving the patient for use at home the following spray—

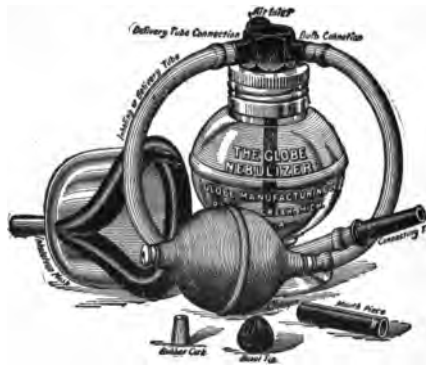
℞.

Cocaine	gr. iv.
Adrenalin	℥ iv.
Distilled water up to	℥ ii.

Mix, and make a solution.

S.—Spray with an atomizer into the nose every hour.

FIG. 22.



A hand nebulizer with attachments for the nose or throat.

At the same time the patient should take one five-grain tablet of suprarenal extract four times each day.

CHRONIC RHINITIS.

Definition.—Chronic rhinitis is a chronic inflammation of the nasal mucous membrane and has but slight tendency to spontaneous recovery.

Etiology.—Frequent attacks of acute coryza, acute attacks of rhinitis following infectious disease. Frequent inhalation of irritating vapors. Any lesion which prevents free respiration

through the nose, such as adenoids, enlarged tonsils, septal spurs, or foreign bodies in the nose. Some of the same causes that are found in acute rhinitis, also act here.

The **symptoms of chronic rhinitis** are much the same as in acute rhinitis, only less severe. Fever is rare. There is an increased irritability of the nasal mucous membrane; also a feeling of stiffness about the nose, and frequent attacks of "catching cold," and of repeated sneezing with considerable discharge from the nose, of mucopurulent character. **On examination** there is a puffy condition of the turbinate bones, sometimes one side being the more swollen and sometimes the other, and the mucous membrane is red and congested in spots, but of soft œdematous consistency which collapses under the application of a little cocaine.

The **prognosis** is, as a rule, good, especially if the cause may be fully corrected.

The **treatment of chronic rhinitis** might be divided into two parts, general and local.

The first and most important **general treatment** is the determination of the cause. If the disease is due to a **constitutional diathesis**, such as gout, rheumatism, or tuberculosis, the treatment must be particularly directed toward the correction of these indirect causes. The general health must be looked after, and, especially, the digestive tract should be kept in as good condition as possible.

Before beginning local treatment, one must always look after the **general health** of the patient, for no matter how careful and scientific the local treatment may be, one will often fail to get good results if he leaves the general condition of the patient below par and does not make allowance and give treatment for that at the same time. In fact, splendid results may be obtained in some of these cases by paying more attention to the indirect cause and letting the local treatment be of the simplest kind.

Tonics of iron, quinine, strychnine, or hypophosphites are beneficial. Good hygienic surroundings, especially in the

sleeping-apartments, and plenty of fresh air and sunshine, are very important. In many cases one may have to advise a change of climate, some people doing much better in high altitudes with dry atmosphere, and others in the sea air.

Local Treatment.—If the chronic rhinitis is due to any **local causes**, such as adenoids, enlarged turbinate bones, or thickened fauceal tonsils, these must all be corrected before a cure may be expected.

One of the first details in the local treatment is to render the parts thoroughly clean by some mild, antiseptic solution for the purpose, such as glycothymolin, borolyptol, boroformalin, thymoformal, Seiler's tablets, or normal saline solution. The proper strength for these solutions would be two drachms to the half-glass of warm water.

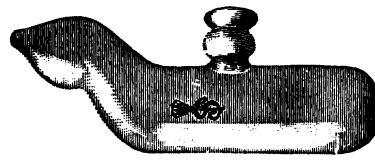
After the nose is thoroughly cleansed, if the mucous membrane is found red and congested at any particular spot, that congestion may often be relieved by carefully making a few applications of ten per cent. nitrate of silver solution to the most affected points. These applications should be made every two or three days, making in all not more than three, and following each with a mild oil-spray.

If the cause is an enlarged turbinate bone, a spur on the septum, or a deviation of the septum, the lesion, of course, should be corrected before local treatment will be of service. If there is a thin, watery discharge, with the redness, and the patient finds it necessary to use the handkerchief often, measures which will dry up this discharge should be adopted, and nothing is better than a mild antiseptic powder for a few days.

In ordering the use of the **nasal-douche cup**, always make the solution *mild* and *warm*, and tell the patient to pour it gently through the nose, tilting the head backward *with the mouth wide open*; as the solution flows through, the head should be put forward and downward. The solution flows out of the mouth and also out of the other nostril. *Never allow the patient to snuff the solution up the nose nor to use force, and warn him to be especially careful not to blow the nose*

hard immediately after using the douche, for in so doing he may force the solution or the nasal discharge into the Eustachian tube and cause an acute inflammation of the middle ear.

FIG. 23.



Nasal-douche cup.

After cleansing the nose with the water solution it is well to use a mild, soothing, oil-spray or vapor from a nebulizer such as—

℞.
Menthol
Camphor . . . . . .āā gr. v.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—Use in an atomizer or nebulizer after cleansing the nose.

The use of antiseptic powders in these cases often acts very beneficially. These powders are very light, and may be had in different combinations, such as ℞. compound stearate of zinc and boric acid; ℞. compound stearate of zinc and alum; ℞. compound stearate of zinc and menthol.

On account of the lightness of the powders one or two drachms is sufficient to prescribe at once and a powder-blower should always be prescribed at the same time (Fig. 24).

The instructions for using the powder are, first to take in a long breath, and while holding the breath to puff some of the powder into each nostril; then to gently puff the breath out through the nostrils. This method frees the nostrils of any superabundance of the powder. The patient must not snuff powder up the nose, or use the powder-blower while breathing,

as, if he does, the powder will get into the pharynx and larynx and cause considerable coughing.

FIG. 24.

A convenient powder blower to carry in the pocket.

HYPERTROPHIC RHINITIS.

Definition.—Hypertrophic rhinitis is a chronic infiltration and hypertrophy of the nasal mucous membrane and tissues, with a permanent dilatation of the bloodvessels.

Etiology.—The disease is usually due to long-continued chronic rhinitis and its causes, and to frequently recurring attacks of coryza.

Pathology.—There is an increase of the epithelial cells, and an infiltration and formation of new connective tissue due to the frequent attacks of inflammation. New bloodvessels are formed and sinuses become thickened and remain distended with blood until the connective tissue formed is abundant enough to cause them to contract. This is more noticeable over the turbinate bones, where very often the inflammatory condition extends to and affects the osseous structures beneath; and, as a result of the want of proper nutrition, the bones often become much enlarged and in some cases undergo degeneration. The mucous membrane over the septum usually becomes thickened and congested, causing further obstruction to the free passage of air through the nose (Fig. 25).

The main feature of the **symptoms** is the persistent and continuous obstruction to nasal breathing; or, as the patient says, "I am not able to breathe through my nose." The tongue and pharynx are dry. The patient sleeps with the mouth open, and snores; sleep is often restless. Hearing may be

affected. Sometimes suppuration of the middle ear appears. The voice has a nasal tone, and the expression of the face is more or less changed. The secretions of the nose are changed, and collect in the nasal chambers, especially at night, and can only be removed by a great deal of care. Often these decomposing secretions find their way into the pharynx and stomach. The pressure caused by the increased size of

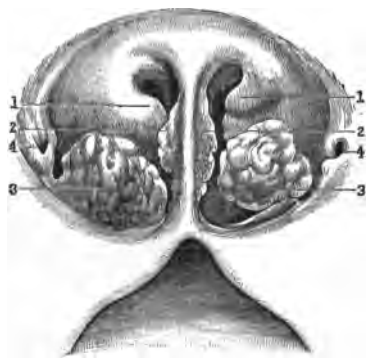
FIG. 25.

View of the anterior nares showing an hypertrophied lower turbinated bone.

the turbinate bones sometimes causes pain over the frontal region, facial neuralgia, or reflex cough, and often all these symptoms will disappear as soon as the nose is put into normal condition. **On examination of the anterior nares** one finds the lower turbinate bones large, red, and congested, and sometimes filling the whole nostril, touching the floor of the nose and pressing against the septum; this obstruction is often increased by the thickened and congested condition of the mucous membrane over the septum. This condition of the air-passage usually occurs on one side, but often varies from one side to the other, the patient saying that sometimes one side is stopped up and sometimes the other.

There is a great deal of discharge from the nostrils, which sometimes flows out in front and at other times into the naso-pharynx, causing, in the latter case, a constant desire and effort to clean the throat. The lower turbinate may not be very large, but on looking at the middle turbinate region, it may be discovered to be enlarged and thickened, and touching the septum, and the mucous membrane over it to be soft and almost polypoid in appearance. These conditions all tend to interfere with the nasal respiration, and as a consequence, the patient has a dry pharynx, with sticky mucus adherent to it, and a "mouth-breather's" appearance and facial expression. It will probably be found **on examining the post-nasal space**, that the posterior ends of the lower turbinate bones are enlarged and pale, and almost like a polypus in appearance, filling up practically the entire region.

FIG. 26.



A view of the hypertrophied posterior nares; 1, shows the middle turbinated bone; 2, thickened granulated on both sides of nasal septum; 3, enlarged posterior ends of lower turbinated bones; 4, Eustachian aurifice.

The **diagnosis of hypertrophic rhinitis** is usually easy, the only trouble one may have is to distinguish which variety he is dealing with. The first is the **temporary** (or **hyperæmic**) form.

This presents the red, congested, turbinate bodies, which are quite sensitive and bleed freely. On using a probe it will be found that the mucosa is soft and compressible, but it quickly returns to its former shape when the pressure is removed. In the other, which is the **permanent** (or **hyperplastic**) **form** the mucous membrane over the bones is paler and less sensitive and is often irregular over its surface. It is more dense in structure and does not yield much to the pressure of a probe and has, therefore, less tendency to elasticity.

If still in doubt as to which form one has before him, let him apply a five per cent. solution of cocaine, on cotton, to the swollen membrane for five minutes. When the cotton is removed, if the swollen condition has nearly all disappeared, one has a simple hyperæmic congestion of the mucous membrane. But on the other hand, if there is very little decrease in the size, then a permanent thickening or hyperplastic condition of the mucous membrane exists.

Treatment.—Before we can decide which form of treatment to give the patient, it is very necessary to distinguish the form of hypertrophy. The key to the **treatment of anterior hypertrophic rhinitis** is to give the patient a free-breathing nostril. This purpose must be accomplished with as little destruction as possible of the nasal mucous membrane.

If on looking into the nostril the **septum** is found to be thickened and congested in any particular spot, as well as having the turbinate bone enlarged, all that may be necessary to do is to reduce the amount of the septal thickening. This may be done by pure chromic acid fused upon the tip of an applicator and carefully applied to the most prominent part of the septum. The burn thus made should be kept covered with compound stearate of zinc and boric acid powder for two or three days. Cauterization in this manner may be sufficient to allow the air to pass through the nostril; congestion is relieved, and the other swelling will often disappear later on, due to the better circulation and to the atmospheric pressure of the inspired air.

If, on the other hand, upon examination, only the **lower turbinate bone** is swollen, red, congested, and is touching or almost in contact with the septum, the operator should reduce the size of this bone. This may be done in four different ways:—cauterization with chromic acid; cauterization with an electrocautery point; cutting a section away with a pair of curved scissors; snaring away a part with a cold wire-snare. The first two methods are more suited to temporary hypertrophy; and the cutting, or the wire-snare, is the best treatment for the permanent or hyperplastic condition. For this reason it is very important to decide the form of hypertrophy.

Chromic Acid Cauterization.—First, on a pledget of cotton, carefully apply over the turbinate bone some five or ten per cent. solution of cocaine, and leave it in position for about five minutes. A few crystals of chromic acid are next fused upon the point of an applicator, forming a small bead on the end of it. The cocaine is now removed and the chromic acid is applied very carefully to the most prominent part of the bone, and held in the one spot for a few seconds. If an **electrocautery point** is being employed it should be a fine one, not too hot, and should be placed *cold* on the most prominent point of the swelling. The current is then turned on for a few seconds, then off, still holding the cautery point in position. This procedure is repeated two or three times, and the cautery is removed when *hot*. It is seldom necessary to cauterize much tissue, or to make a long scar extending backward on the bone. The electrocautery is better, in most cases, than the chromic acid, for the acid liquifies quickly and often burns other parts unnecessarily.

The inflammation set up by both these methods has a tendency to fasten the mucous membrane to the bone beneath, and thus to cause a shrinking of the tissues. In either case, the nostrils should be kept well covered with powder for two or three days. This will lessen the reaction from the burning, and, in a way, help to contract the mucous membrane. After a few days the scab will fall off; the contracting of the tissues

over the bone still goes on and in a very short time one will find a clear and open nostril. It may be necessary for a few days to have the patient, at home, wash the nose once or twice daily with some warm, weak, antiseptic solution (Fig. 27).

If the swelling is very large and does not contract under the influence of the cocaine, the operator will then reduce the size of the swelling by cutting away part of the redundant tissue with a pair of **curved scissors** or a **cold wire-snare**. The part that is usually taken off is the lower anterior part of the inferior turbinate bone. After this operative work, it is well to use the powder for a few days; then after that keep the nostril clean with an antiseptic wash, and follow this with an oily spray such as—

℞.

Carbolic acid (95 per cent)	♏ ii.
Eucalyptus oil	♏ v.
Oil of pine	℥ i.
Liquid albolene up to	℥ i.

Mix, and make a solution.
S.—Use in the nose twice daily.

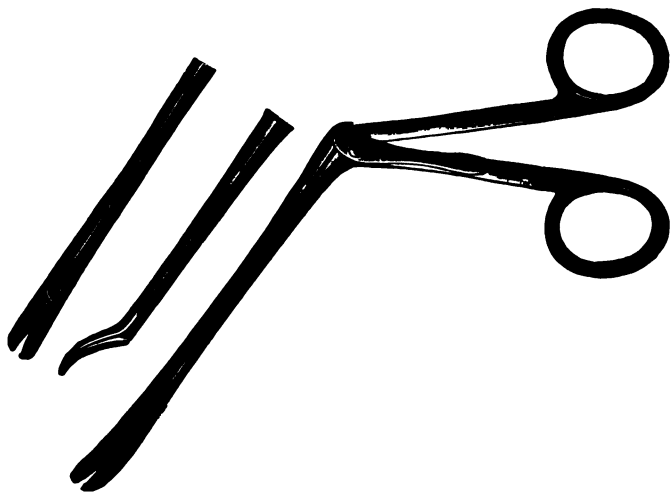
Treatment of Posterior Hypertrophic Rhinitis.—A study of Fig. 26 will show the exact condition referred to by the foregoing term. The posterior ends of the lower turbinate bones become large, in some cases fully blocking the posterior nares; and the same condition of thickness may extend to and affect the septum, the mucous membrane over it becoming much swollen and thickened.

The treatment of this form of hypertrophic rhinitis is quite different from that in the anterior nares. The swelling must be taken away and the thickened places reduced in size. This work has to be done either by burning or cutting. The removal is best accomplished by a **straight wire-snare**, as shown in Fig. 27. Use cocaine for five minutes in the anterior nares of the side intended for operation, then cleanse with an alkaline wash or douche. The cold wire-snare is now passed through the anterior nares till the pharynx is reached; then,

by careful manipulation, the loop is passed over the growth, which is then *slowly* snared off. The operation may be done by using a **curved** or **bent snare** and passing it up behind the soft palate; the loop of the wire is then worked over the growth and it is snared off.

The only objection to this form of treatment is the **hemorrhage** which often follows, and the difficulty of controlling

FIG. 27.



Holmes' set of nasal scissors for cutting turbinated bone.

it. The blood constantly drips into the pharynx, and there is no chance for a clot to form. This can be avoided by using a Bernay's sponge, placing the large end in the nostril first and pushing it well back. As soon as the sponge swells, it exerts enough pressure to control the bleeding. The sponge may be left in for forty-eight hours, and, when removed carefully, there is little danger of further bleeding.

Chromic acid may also be applied to the centre of the growth which then shrinks up very well. To do this it is necessary to

have a self retaining palate-hook, or have an assistant pull the palate forward with an ordinary palate hook or an applicator bent for the purpose. A long applicator is taken, and bent to a right angle about one inch long. The acid is fused on the end of the applicator, and, with the aid of a small mirror, is applied very carefully to the centre of the growth; this usually shrivels it up enough to allow the air to circulate through.

FIG. 28.

Showing the gold wire snare passed through the nares and looped over the posterior end of lower turbinate bone.

The **after-treatment** in all these cases is simply to use any mild alkaline wash with a douche cup for a few days.

If there should be much reaction from the cutting or the burning, have the patient use the compound stearate of zinc and boric acid powder four or five times each day.

Treatment of Enlarged Middle Turbinate Bones.—The bone is enlarged, red, congested, and sometimes very dry. It presses against the septum, and looks almost like a strawberry pushed up into that part of the nostril. The patient will often complain of frontal headache, dryness of the nose, and an inability to breathe properly. **On examination** the middle turbinate bone will be found to be much swollen, pressing against the septum and also against the outer side of the nos-

tril, completely shutting out the air from that region of the nose. The mucous membrane looks thickened, and is sometimes of a dark-red color; but usually, especially in old cases the color is paler, and the membrane is often covered with scabs and particles of dust, that collect over the anterior end of the bone. The object of the treatment is to reduce the size of the bone, to relieve the pressure, and to allow the air to circulate about the bone, which must be done with as little destruction of tissue as possible, and which might be divided into three different steps, according to the severity of the case.

1. **Scarification.**—First apply some five per cent. cocaine over the region of the bone for five minutes, remove the cotton, cleanse the nostril with some antiseptic solution, and with a pair of curved scissors or bistoury, make several incisions along the anterior surface of the bone, cutting through the membrane down to the bone, but avoiding the sides of the bone for fear of forming adhesion with the septum and thus defeating the object of the treatment.

On account of the thickened condition of the membrane, and the venous congestion which is nearly always present these incisions often bleed freely; but this is exactly what is wanted, as it relieves the congestion. A scab is formed, which contracts during the next three or four days, and when removed the bone will usually be found reduced in size and the unpleasant symptoms complained of to have disappeared. In this case the use of a powder should not be allowed, but the patient may for the first few hours use a mild, warm alkaline douche.

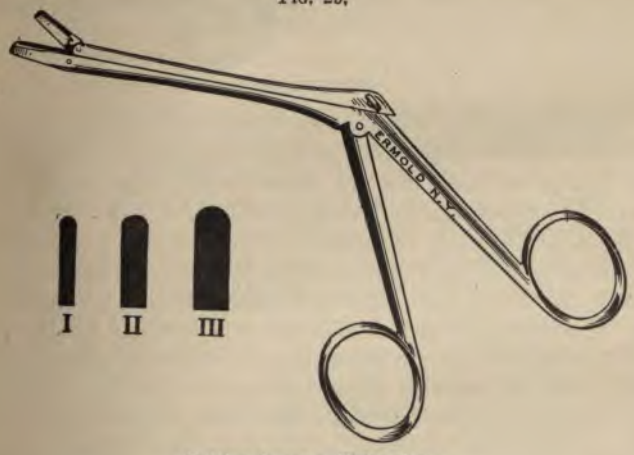
Rarely the operator may find a case that bleeds too freely and it may be necessary to place a small piece of styptic cotton over the bleeding surface for a few hours.

2. **Chromic Acid Cauterization.**—If at the end of a week the tissue is not sufficiently shrivelled, and the bone is still larger than it should be, we may employ the next step in the treatment; that is, the application of chromic acid fused on the point of an applicator to the same cut surface. This will shrink

up the surface and form a scab surface which in the course of a week will drop off, leaving the whole bone much reduced in size. An oil-spray is pleasant to use for a few weeks about twice each day.

3. **Partial Resection.**—These two steps of the treatment are usually all that are required. If the symptoms still persist and very little shrinkage has taken place, the next step is to take a pair of special curved scissors and cut away the anterior third of the bone; or a small pair of cutting forceps may be used to cut or bite away the anterior end of the bone.

FIG. 29.

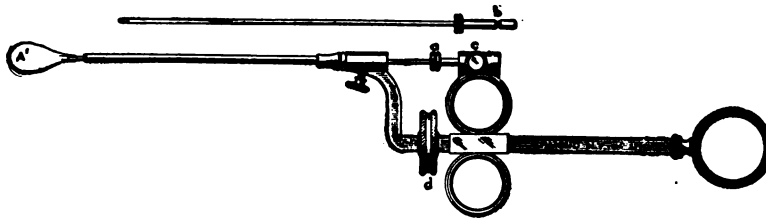


Cutting forceps—Three sizes.

4. **Total Resection.**—If these conservative methods fail to cure, then it will be necessary to cut or snare out the whole middle turbinate bone, using a strong Douglas snare. *This, however, is only done in extreme cases, and should be avoided, if at all possible, on account of the destruction of so much mucous membrane, and the tendency to atrophic rhinitis, which is apt to appear within about six months or one year.* (This warning does not refer to the enlargement of the middle

turbinate bone that is associated with accessory sinus trouble, where it is necessary to remove the whole bone in order to be able to treat the sinus. The treatment in that particular disease will be taken up in speaking about the treatment of sinus cases).

FIG. 30.



Douglas snare.

Sometimes, when the middle turbinate bone is cut, considerable hemorrhage may result, especially in old people; and it may be found that the powder ordinarily used in nasal operations to control the bleeding will not stop it. It will then be necessary to plug the nose for a few hours. A small piece of cotton soaked with adrenalin and placed carefully over the middle turbinate bone for a few hours will stop all the bleeding. The **electrocautery** is seldom or never used in the treatment of the middle turbinate bones. The reaction from the burning of the middle turbinate bone with the cautery is quite marked, and a few cases have been reported where the inflammation has extended to the meninges, causing serious or fatal results.

ATROPHIC RHINITIS.

Definition.—Atrophic rhinitis is the condition opposite in nature to that of hypertrophic rhinitis. It is a dry, shrunken condition of the nasal mucous membrane, often extending to the bones, which look much smaller in every detail, especially over the lower turbinate bone.

The real **cause of atrophic rhinitis** is not fixed beyond doubt. It is usually a sequence of hypertrophic rhinitis and of frequent attacks of acute cold in the head. There are certain constitutional causes which predispose to it. It is seen most frequently in people of turberculous or scrofulous diathesis, and in young girls who live in bad hygienic surroundings. It is seldom seen in very young people.

Pathology.—The secreting glands of the nose are atrophied, and the character of the secretion is changed from a natural, thin, watery, to a thick, mucopurulent consistency, which may collect in the form of scabs and crusts and sometimes become very offensive in odor. The mucous membrane is pale, the inferior turbinate bone is so atrophied that one may see through the nostril to the postnasal space, the mucous membrane of which has a dry, shining appearance. In some cases the membrane is so dry and parched that although there is apparently plenty of space for respiration, the patient complains of not being able to breathe through the nose.

The surface of the mucous membrane is deprived of its epithelium, and there is a formation of fibrous connective tissue which hardens the mucous membrane and, by contracting, causes the secreting glands to dry up and almost disappear. The mucous membrane becomes dry and glazed, and the natural secretions of the nose are lessened in amount and much thickened, so that the air, in passing to the lungs, is not moistened as it should be. This in time will cause more or less laryngeal, tracheal and bronchial disturbance.

The **symptoms of atrophic rhinitis** may be divided into two classes, objective and subjective.

Subjective Symptoms.—The patient complains of a dryness in the nose and of a dropping of mucus into the throat; sometimes of not being able to breathe properly through the nostrils. Headache is a frequent symptom, as are also offensive breath and sometimes the loss of the sense of smell.

On **examination** there are found large, roomy nostrils, with the mucous membrane pale and dry. The secretions lose

their serous character, and collect and form characteristic scabs and crusts, which are closely adherent to the mucous membrane and are often quite difficult to remove. These scabs and crusts may have quite an offensive odor, but this fetid odor may also be observed in syphilitic rhinitis. The scabs and secretions adhere to the membrane not so much from their nature as on account of the fact that the inspired air, in passing through nostrils so roomy, does not have force enough to blow them out; and many patients will acquire the habit of constantly blowing the nose, this severe blowing, and the picking of the nose, necessary to get rid of these crusts, often causing nose-bleed. There may be ulceration, but this is slight except in some very severe cases. The middle turbinate bone is often large, swollen, and found pressing against the septum. The scabs and crusts are found more frequently in the region of the middle turbinate bone, because very little secretion comes from it, and the scabs collect more easily, while the lower turbinate bone, which is the great secreting organ of the nose, is usually washed clean by the secretions which flow from it.

The **diagnosis** is as a rule easy. The examiner has only to exclude the atrophic condition due to caries or syphilis, which are distinct forms of rhinitis but quite different from the ordinary simple atrophic rhinitis.

Treatment.—This is one of the most troublesome forms of nasal diseases to treat, and the prognosis must always be given in guarded terms. Many of these patients have been treated a great deal, and often their first question on coming to a physician will be—"Doctor, can you cure me?" Absolute cure should never be promised. One can always alleviate the symptoms, make the patient much more comfortable, and prevent the disease from going on to a much worse condition. After a few treatments the results are usually so marked and the patient feeling so much relief, that he is perfectly willing to continue under the treatment until he is very much improved. It requires a great deal of care, good judg-

ment, and patience, and usually long treatment. Often what succeeds well in one case will not in another.

The chief points in the treatment are to free the nose of all scabs and crusts, to thoroughly cleanse the membrane, and to keep it in as clean and aseptic condition as possible.

The **treatment in the office** would first be to cleanse the nostrils thoroughly with some mild antiseptic solution, such as normal saline solution, Seiler's solution (using one tablet in a half-glass of water), or one drachm of borolytol, enzymal, glycothymolin, or thyneaseptic, in a half-glass of water. *These solutions must all be warm.* Use a nasal douche-cup two or three times in each nostril. The procedures will avail in mild cases. Another serviceable detail is to wash the nostrils from behind, by using a postnasal syringe behind the soft palate and forcing the water gently out through the nostril.

The author thinks well of using a wash-bottle, or a large atomizer with a free opening, that may be attached to the air-tank; by forcing the solution into the nostrils with the compressed air, the nostril will be very well cleansed.

In some cases the scabs and crusts are so hard and thick that no amount of washing can dislodge them, and they will have to be removed with forceps. After the nostrils have been well cleansed in this manner it is always well to take cotton on an applicator and further cleanse them in every part.

General cleansing is the first step in the treatment of atrophic rhinitis, and it is the most important one. The next step is to restore the natural secretions of the nose by the application of some remedy that will stimulate the glandular structure of the mucous membrane, relieve the dryness and the granular tendency of the membrane, and, in short, to bring the parts to as healthy a condition as possible. There are several methods of doing this, with varying results, nearly every author having some particular choice of his own. One of the best and simplest procedures is to take an applicator, with cotton, and rub and massage the interior of the nostril, over the septum and turbinate bones, using any of the fore-

going antiseptics. Making the strength of solution 25 per cent. in warm water, and gradually increasing the percentage, so that, after a few treatments, the solution is full strength. If there should be much granular surface, one is very apt to produce a little bleeding during the first few treatments, but this soon passes away. After cleansing and rubbing in this way, the nostril should be sprayed with an oil spray, such as plain liquid albolene, or liquid vaseline. The patient should come to the office three times a week, then gradually lengthen out the time between each visit. This is absolutely necessary because of the difficulty patients will have at first in cleaning the nostrils. The progress by treatment once a week is so slow, that very often the patient becomes discouraged before any improvement is noticed.

At home, the patient should use a douche-cup night and morning, then, after blowing the nose gently, use the following spray or ointment:

℞.
Camphor . . . . . gr. v.
Chloroform . . . . . gr. v.
Liquid albolene . . . . . ʒ i.
Mix, and make a solution.
S.—Use with an oil atomizer in the nose several times daily.

Or,—

℞.
Camphor . . . . . gr. v.
Eucalyptol . . . . . ♏ v.
Cold cream . . . . . ʒ i.
Mix, and make an ointment.
S.—Rub a small piece into each nostril at night.

After the parts have been cleansed, ichthargan (two to ten per cent.) in liquid albolene, makes an efficient, stimulating application. Ichthyol, ten to forty grains to the ounce, and even stronger, acts as an energetic stimulant when rubbed over the mucous membrane of the nostril, but the odor is

disagreeable, and many patients will object to it on that account. Tampons of cotton, saturated with any of the foregoing solutions, or even the plain antiseptic cotton, placed in the nostril and left there for twenty-four hours, acts as a good stimulant, giving a rest to the mucous membrane, and increasing the activity of the glands. This method may be employed in each nostril alternately, but it is not used now nearly as much as in former years.

In other cases good results are obtained by using a post-nasal syringe, with a mild antiseptic solution. The syringe being bent, the tip is passed upward, behind the soft palate. The patient opens his mouth wide, and bends the head a little forward; the piston of the syringe is slowly pushed down the cylinder, and the solution flows freely out of both nostrils. Some patients can learn to do this themselves, and when they do, the results are very good.

Fig. 31.

Syringe for washing the posterior nasal space.

Some cases, which do not respond well to any of the foregoing forms of treatment,—especially if they have been treated a great deal with different sprays and washes, and the mucous membrane is red and conjested,—will do well by using a powder in the nose for a few days to quiet the inflammation.

℞.
Iodoform
Zinc stearate comp . . . . . āā ʒ i.
Mix, and make a powder.
S.—Puff into the nose with a powder-blower every few hours.

℞.

Bismuth	ʒ i.
Boric acid	gr. xx.
Stearate of zinc comp.	ʒ i.

Mix, and make a powder.

S.—Use in powder-blower in the nose several times each day.

Systemic Treatment.—Build up the general health with tonics, iron, quinine, strychnia, cod-liver oil and hypophosphites. Potassium iodide, in small doses, often acts well in some of these atrophic conditions, by stimulating the glandular structures, and changing the secretions into a watery discharge. Good food, out-of-door life, and improvement in the hygienic surroundings in every possible way, are to be employed.

OZENA.

Definition.—Ozena is the term applied to that form of atrophic rhinitis characterized by a very offensive odor. Ozena is not of syphilitic nature. Some works speak of atrophic rhinitis, dry rhinitis, and ozena as the same disease. One will often find atrophic rhinitis without ozena, but seldom ozena without atrophic rhinitis, so that it is really one form of atrophic rhinitis.

Causes.—Ozena is usually seen in people who are in a debilitated condition, in young girls who work in factories, and occasionally in healthy boys. The odor is usually due to the retained secretions of the nose, which decompose and ferment. This decomposition may be due to certain microbes. The odor may come at times from the retained secretions in the accessory sinuses.

The **diagnosis** is made from the odor, which is usually very offensive to people sitting near the patient. The sense of smell is often destroyed, so much so in many cases, that the patient does not detect the odor proceeding from his own nose.

On **examination** the nose is found large and roomy, the nostrils filled with scabby secretions, sometimes forming in

hard masses, and filling up the entire nostril. When the scabs and crusts are removed by douching or forceps, the mucous membrane is found pale, excoriated, almost granular in places, very tender and sensitive to the touch, especially in the region of the middle turbinate bone. Some ulceration is visible in places, and often bleeding with very little cause. In some advanced cases, necrosed or exfoliated bone will be found, which, in that particular individual, might account for the odor.

The **differential diagnosis** has to be made from the odor caused by a foreign body in the nose. It will be noticed that, when a foreign body is present, the discharge all comes from the one side of the nostril. If due to any antral or sphenoidal lesion, the odor is usually only noticed by the patient, on account of the secretions dropping, or flowing, down the pharynx.

The odor found in some forms of syphilis is so characteristic and peculiar to that particular disease, that it can hardly be mistaken for anything else.

The **treatment** is very much the same as in other forms of atrophic rhinitis, but for the first few weeks, nothing seems to act better in destroying the odor than peroxide of hydrogen. After removing the scabs with forceps, wash and cleanse the nose thoroughly with peroxide. This will leave the nose in a foamy, soapy condition, which can all be cleansed out with alkaline solutions. If any granular surfaces are found, apply carefully—

℞.
Nitrate of silver solution . . . . ʒ i. in ʒ i.

Or,—

℞.
Iodine . . . . . gr. v.
Potassium iodide . . . . . gr. x.
Glycerine . . . . . ʒ i.
Mix, and make a solution.
S.—Apply with a cotton swab, every other day.

If any necrosed bone is present, it must be removed with small forceps or curette, and the mucous membrane thoroughly cleansed with peroxide of hydrogen and warm alkaline solution. If there should be any obstructions to free respiration in the upper respiratory tract (such as adenoids in the postnasal space), spurs or exostoses on the septum, marked deviations of the septum, or enlarged, unhealthy faucial tonsils, must, of course, be removed before particular benefit is noticed. These patients should come to the office every other day for a few weeks, and the nose should be cleansed thoroughly with peroxide of hydrogen, so long as odor is detected. The parts should then be rubbed and massaged with a 50 per cent. solution of glycothymolin, borolyptol, or a 10 per cent. solution of ichthyol in keroline. After this has been done, spray the nostrils with a mild, lubricating spray.

The treatment at home by the patient is most important, and should be carefully attended to. Douching and washing the nose should be employed, three or four times each day, with boroformalin or borolytol, using ʒ ii in a half-glass of warm water followed by a nebulizer or oil atomizer with the following formula:

℞.
Carbolic acid . . . . . gr. iii.
Oil of pine . . . . . ♏ xv.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray into the nose, after douching.

Patients who cannot afford to buy an atomizer, may use ointments, such as,—

℞.
Iodol . . . . . gr. v.
Boric acid . . . . . gr. x.
Cold cream . . . . . ʒ ii.
Mix, and make an ointment.
S.—Rub a little into each nostril before going to bed.

For some time the author has been using, with a great deal of success, in some atrophic and ozeanic cases, a new antiseptic solution, enzymol. This is diluted in warm water, (one part enzymol, and three parts water). The nose is thoroughly cleansed and rubbed with the solution, which seems to have a very healing effect on the granular surface. A piece of cotton may be saturated with this solution, placed in each nostril, and left in contact with the tissue fifteen or twenty minutes.

VASOMOTOR RHINITIS.

Synonyms.—Hay fever, rose cold, June cold, hay asthma.

Definition.—Vasomotor rhinitis is a nervous affection occurring at certain seasons of the year, usually August and September.

Etiology.—The cause varies in different individuals; but there are **certain points common to all**; viz.,

1. A peculiar predisposition.
2. A sensative area in the nasal mucous membrane.
3. The presence of an exciting cause circulating in the air.

The **exciting cause** usually is the dust, or pollen, of certain plants, such as ragweed, hay, and barley; the odor of certian flowers, such as roses and golden rod; the dust of drugs, such as ipecac and benzoic acid; and, occasionally, the odor of some animals.

The **attack of vasomotor rhinitis** usually comes on each year, about the same date, growing worse each year, and, in time, affecting the mucous membrane of the bronchial tubes, thus setting up asthmatic conditions. The attacks begins with a peculiar itching, burning sensation of the mucous membrane of the nose and eyes. The mucous membrane of the nose is often swollen so much that it obstructs respiration. The eyes are conjested and red, and violent sneezing takes place, which may last for some time. There is a profuse watery discharge, which is very irritating, and which in time, becomes mucopurulent.

Differential Diagnosis.—Vasomotor rhinitis might be mistaken for an acute rhinitis, and in cases of young children, especially if it should be the first attack, it may be necessary to watch it for some time before being sure of the diagnosis; but in cases of older patients, the history, the suddenness of the attack, the extreme irritation of the nose and tendency to asthma, the attacks of sneezing, which may easily be brought on by touching the mucous membrane over the upper part of the septum, and, lastly, the annual recurrence at about the same time of the year without a known cause, will usually make the diagnosis easy.

The **treatment of vasomotor rhinitis** varies in different cases, and during an acute attack it is difficult to do much more than give some relief to the most distressing symptoms. One may try the following measures:

℞.
Suprarenal extract tablets, each . . . . gr. v.
S.—Take one every four or five hours.

Or,—

℞.
Pill blennostasin, each . . . . . gr. v.
S.—One every four hours.

Cocaine in mild solution usually gives temporary relief; but the patient should not know that he is using cocaine. It is well to prescribe it as follows:

℞.
Cocaine . . . . . gr. vi.
Adrenalin 1-1000 . . . . . ♏ v.
Aqua . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray into the nose every two hours.

After using the adrenalin spray, which shrinks the mucous membrane, apply an oil spray, such as—

℞.
Thymol
Menthol
Camphor . . . . . āā gr. v.
Liquid albolene . . . . . ʒ i.
Mix, and make a solution.
S.—Spray into the nose three or four times each day.

In some cases a drying powder does well, such as—

℞.
Compound of stearate of zinc and alum . ʒ i.
S.—Puff it into the nose with a powder-blower every hour.

Many of these patients are of very nervous temperament. Soda bromide, in gr. xv. doses, three or four times each day will often be beneficial. Small doses of atropine, given three or four times daily will help to lessen the secretion.

Liquor ambrosia, which is a decoction of the flowers supposed to cause this irritation, is spoken of very highly by some who claim to have good results in certain cases. No matter what local treatment is being given, the general health should be brought into as good condition as possible. Various tonics should be used such as strychnia, phosphorous, arsenic, and soda bromide, the bowels should be kept freely open, and plenty of lithia water taken. People subject to these attacks should receive treatment between the attacks, or when the nose is in a quiet condition, and free from the irritation which causes the trouble.

The object of the treatment at such times is to get the nose in as good condition as possible; that is, if there are any spurs on the septum, or if there is any enlargement of the turbinate bones, or any deviations of the septum, or any congested thickening of the mucous membrane at any particular spot, these should all be corrected. After these have healed, treatment should be continued with the idea of making the mucous membrane of the nose as immune as possible to irritation. This is done by rubbing and massaging the mucous membrane of the nose, especially that over the upper part of the

septum, every day or every other day, with a solution of borolyptol or glycothymolin, followed by some mild oil spray.

The first few applications of this treatment will cause violent sneezing, and considerable irritation, but very soon the membrane becomes used to it and no sneezing results.

If the treatment is continued between the attacks, or preferably, in the warm weather, many cases may be cured and the nose will be in such good condition that when the usual time comes for an attack, it will be very much less severe than usual.

Prophylaxis.—Just before the regular time for the expected outbreak of hay fever to occur, it is well to have the patient take mose ordinary precautions, such as suprarenal tablets, five grains three times daily, or blennostasin, gr. v., three times each day; and, also, to spray the nose twice daily with a very mild adrenalin solution. In spite of all forms of treatment, in some cases nothing will have much effect, and the patient must be sent to a different climate, some getting immediate relief in the dry mountain air, while others experience the same relief by going to the seashore or on an ocean trip.

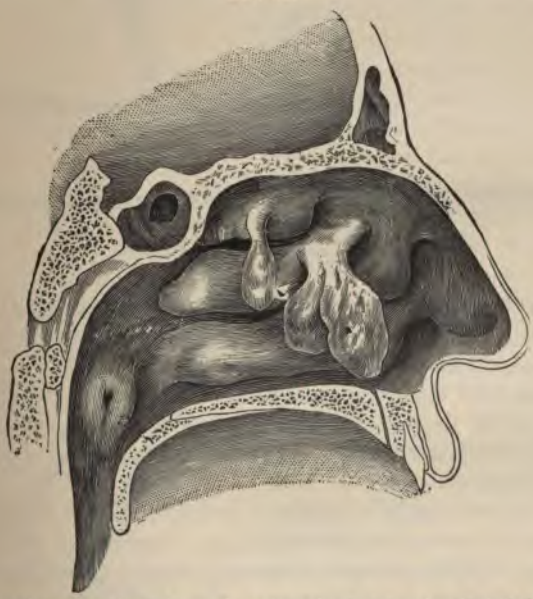
NASAL POLYPUS.

Definition.—Nasal polypus consists of a soft, gelatinous, whitish growth, usually found in the upper anterior part of the nostril (Fig. 32). If large, it may extend to the floor of the nose. It is quite soft and movable, being easily pushed aside by a probe; even the air passing through the nostril will move it backward and forward.

There may be one, or several, of these growths, and they may completely fill the nostril. The most usual seat is the side or under surface of the middle turbinate bone. They sometimes spring from the posterior end of the middle turbinate, and gradually extend backward, filling up the posterior part of the nostril, and even extending into the postnasal space; if large, they may be seen below the soft palate.

The **pathology of nasal polypus** is that of a low grade connective-tissue tumor, a sack of connective tissue, covered with epithelial cells, and containing a few bloodvessels and nerves. Those found in the posterior nares are much more dense, and contain more fibrous connective tissue, in fact, are sometimes quite hard; are more difficult to remove; and at times their stumps bleed quite freely when excited.

FIG. 32.

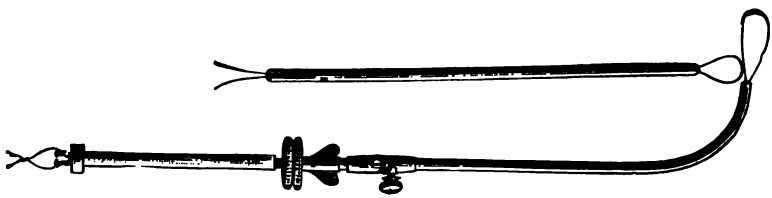


Vertical section through nasal cavity, showing nasal polypi (Seiler).

The new polypus, having just begun to grow in the nose, has a pulpy character, and consists largely of fluid. It grows more vascular, and, as it increases in size, its own weight bears it down toward the floor of the nose, giving it a pedunculated appearance. Lock defines nasal polypus as, "a localized

patch of œdematous mucous membrane, dependant upon subjacent bone disease." Some books say that polypus is only an evidence of bone disease and that necrosis will be found in every case of polypus. Both these definitions seem to be partly correct. One may find cases of simple polypus, which, when removed by a wire-snare, never again cause any trouble; but in old chronic cases, where there is a tendency for polypus to return after the simple removal, one will find that the inflammation causing the polypus has extended to

FIG. 33.



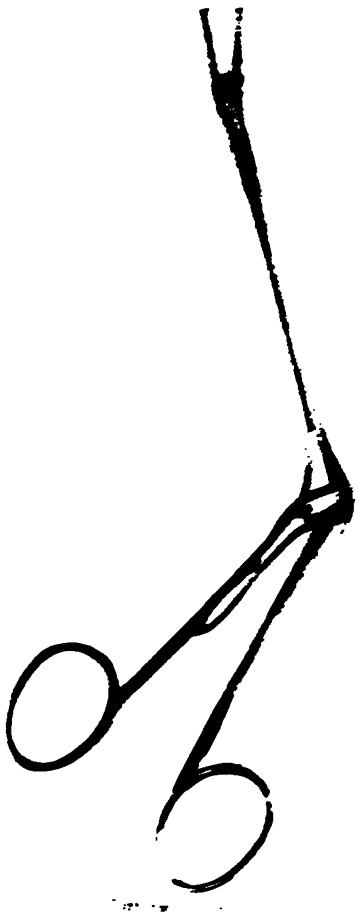
Jarvis straight and curved snare.

the bone beneath, causing necrosis and partial absorption of the bone, and that the inflammation may even extend up into the ethmoid cells.

Symptoms.—There is considerable acrid discharge from the nostril. The patient complains of not being able to breathe through the nose. The voice has a nasal tone, due to the obstruction.

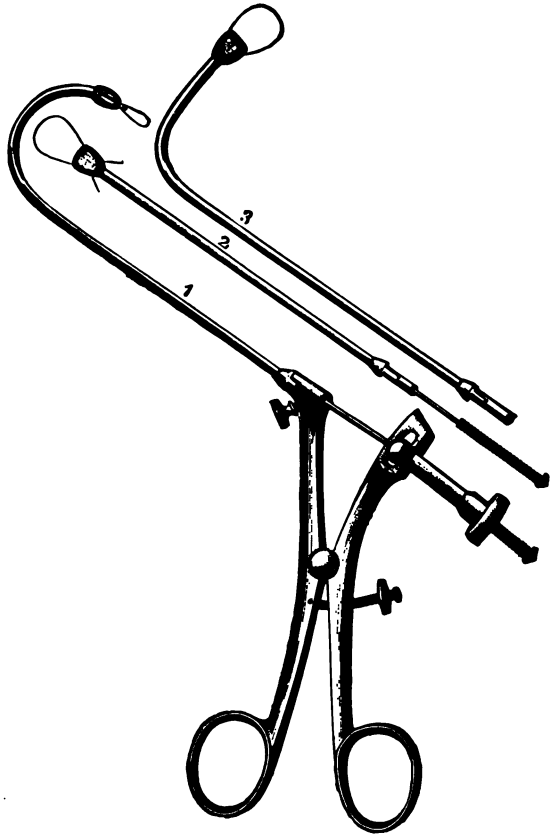
The sense of smell is impaired, and an irritable, dry pharynx is present, due to mouth-breathing. Later on, reflex nasal symptoms appear, such as sneezing, coughing, asthma.

The **diagnosis** is easily made. On inspection, one finds a pale, whitish, soft, glistening growth in the upper part of the nose, in the region of the middle turbinate bone. This may be easily moved with a probe. If the growth is large, it may fill up the whole nasal space, down to the floor of the nose. If the patient blows the nose hard, he will often bring it more plainly into view.



of the first having been removed, others have come down into view. When all have been removed, it is well to take a

FIG. 35.



Sajous' combination set of snares.

small pair of cutting forceps (Fig. 34), and nip away any particles which might remain, being too small to be grasped by the snare. In some cases it may be necessary to apply

chromic acid to the base of the pedicle, or to the under surface of the middle turbinate bone. The bleeding, as a rule, is not severe, and usually stops without any treatment, or upon the application of some very simple remedy. It may be necessary for the patient to make three or four visits to the office before all are removed, and it is well to see the patient occasionally for the next year or two.

When the polypi are far back and drop into the postnasal space, it may be necessary to remove them through the mouth. This is done with a curved snare, passed back of the soft palate, and worked over the growth until a good hold is secured. Use cocaine freely over the soft palate, and pull the palate forward with a palate hook, if necessary.

If a curved snare is not at hand, the growth may be removed with a straight snare through the nostril, passing it back till the wire appears in the pharynx; then, with the fingers of one hand, spread the wire, and work it over the growth. When once a hold is secured, turn the thumb nut slowly on account of the fibrous nature of the growth, and also to avoid the hemorrhages which might take place on account of the denseness of the tissue.

ADENOIDS.

Synonyms.—Pharyngeal tonsil, Luschka's tonsil, postnasal growth, adenoid vegetation.

Definition.—Adenoids are overgrowths, or thickenings of the glandular tissue in the vault of the pharynx. They are on the upper posterior wall, often filling the whole space, especially the part behind each Eustachian tube.

Pathology.—Adenoids, pathologically, might be divided into two classes:—

First, a soft, pliable mass, composed mostly of lymphoid tissue, and covered with ciliated epithelium. It is plentifully supplied with bloodvessels, and has a small amount of connective tissue.

The second kind is much firmer, contains more connective tissue, and is the one usually seen in adults.

When we speak of adenoids, or pharyngeal tonsil, we must also remember that there are faucial tonsils; a lingual tonsil at the base of the tongue; and the laryngeal tonsil situated in the ventricles of the larynx. These are often closely associated, and, in some cases, one will find the whole of them enlarged.

The pharyngeal tonsil is one of the most important. It is highly vascular and has a tendency to atrophy as adult age is reached. Some look upon an enlarged tonsil, whether pharyngeal or faucial, as abnormal glands which should be removed, Many people have gone through life with enlarged tonsils. and have apparently suffered no inconveniences; but, in spite of this fact, it only seems reasonable to think that these same people would have had more comfort, and would have enjoyed life better, if their upper respiratory tract had been in a healthy, normal condition.

Adenoids may be seen very early in life, and are, in some cases, congenital. They are very harmful to a nursing child, and seriously interfere with its nutrition. They are not often seen in adults, but occasionally their remnants appear in the form of hard, firm tissue, in the upper part of the pharynx. They usually begin a spontaneous atrophy at the age of fifteen to eighteen years.

Etiology.—The cause of these growths is more or less uncertain, and may be divided into predisposing and exciting factors.

Predisposing Cause.—Heredity or race has a slight effect. Climate has considerable, as adenoids are seen more frequently in cold, damp climates. Anything which obstructs nasal respiration, and causes more or less congestion of the tissues,—such as deviations of the septum, spurs on the septum, enlarged turbinate bones—is not without effect. High arched palate seems to affect the condition of the nasal passages and postnasal space. Enlarged faucial tonsils are an uncertain

cause; for, while they are often associated with adenoid enlargement, and certainly cause some obstruction and irritation, it is still in doubt whether they are an indirect cause of the adenoids, or whether the adenoid enlargement, and consequent mouth-breathing, is a cause of the enlarged faucial tonsil.

Direct or Exciting Causes.—Exposure to cold and wet, acute fevers, scarlet fever, measles and diphtheria.

Symptoms.—The symptoms of adenoids are usually well marked, but may vary considerably with the age of the patient

FIG. 36.

Facial expression in Adenoids.

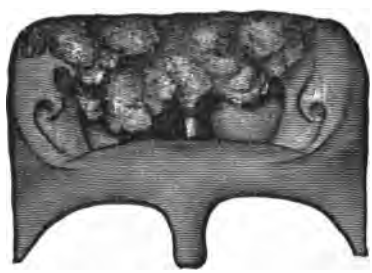
and the amount of tissue involved. A small amount in some people causes a great deal of disturbance, while in others a very large amount may be present without any complaint being made. The patient breathes with the mouth open; sleeps with mouth open and snores; catches cold easily and often. The nostrils are often excoriated, due to the acrid discharge which comes from the anterior nares. The hearing is often affected, and this may be one of the first things complained of. The expression of the countenance is more or less stupid and characteristic. Mentally, the patients are sometimes very dull and stupid, which may be due partly to the

hearing being affected. Nosebleed is a common symptom, and very often the patient has a hacking cough, due to dryness of the larynx, consequent upon mouth-breathing. If these conditions are not corrected, the child becomes pale, anæmic, flat chested, and the general health is below par in many ways.

Diagnosis.—The diagnosis is usually easily made from the general appearance and history.

In **young children**, mouth-breathing is caused, as a rule, either by some foreign body in the nose, or by adenoids, and in most cases it is easy to exclude any foreign body. We examine the mouth and may find enlarged faucial tonsils, a granular condition of the pharynx with frothy, rather sticky secretions attached to it. When the child gags, some of the secretion is forced downward behind the soft palate, and this condition, with a history of mouth-breathing and frequent colds, is almost a positive evidence of adenoids. (Fig. 37).

FIG. 37.



View of the vault of the pharynx filled with Adenoids.

In **older children** one may get a very dry pharynx, but it is rare. If the patient will remain passive, so that one may use a small rhinoscopic mirror, the diagnosis is made at once by the appearance of soft, boggy tissue, or of almost a roll of tissue situated in the upper part of the pharynx, usually in the center, behind and overhanging the upper part of the septum. When the tissue is very abundant, it will be found at the sides

of the pharynx, especially behind the Eustachean tubes. It is often impossible to use the mirror in the clinic, but in one's office, with a little patience, a very good view of the postnasal space may be had.

Digital examination is highly spoken of by some authorities. It is unpleasant to and will often frighten the child very much. Stand at the right of the patient, with the left hand on the side of the face; use the left forefinger in such a manner that when the child opens the mouth, it is easy to press in the cheek muscles and to prevent him from closing the teeth on the fingers. Now, with the forefinger of the right hand, palm upward, pass behind the soft palate—where is found a soft, spongy tissue, which bleeds easily. There is a small hook-like instrument which fits the index finger, and some practitioners think very well of this method of removing adenoids.

In the great majority of cases, it is not necessary to use the finger as a means of diagnosis, and, as a means of removing them, it is not satisfactory.

Treatment.—In all cases removal is necessary, and the following instruments are required:—tonguedepressor, mouthgag, adenoid forceps, adenoid curette.

The operation may be done with or without a general anæsthetic. In the majority of cases it is better to use an anæsthetic, because one may take more time, do the work more thoroughly, and be less likely to frighten the child, as there is usually considerable bleeding for a few minutes.

In adults, it is necessary only to use a little five per cent. solution of cocaine around the soft palate, simply to lessen the irritability in putting the curette or forceps behind it. *Do not use cocaine on the adenoid tissue, as it shrinks and toughens the tissue and makes it more difficult of removal.*

The selection of the anæsthetic for this operation is very important. Chloroform, which is usually a safe anæsthetic for children, does not seem to act well in this operation, and the mortality is greater in this than any other operation,

under chloroform. The depressing effect which is noticed may be due to the lymphatic or glandular condition of the child, and it is now generally conceded that it is not safe to use chloroform in adenoid operations.

Ethyl chloride has been used successfully by some, but the difficulty in getting a pure product, and the consequent dangers of it, has rather prevented its general use. Ether in all cases is to be preferred, and the method of starting with nitrous oxide, followed by ether, is the safest and best form of anæsthesia.

Technic Without an Anæsthetic.—Pin a towel or sheet around the arms and body of the child; place it on the nurse's lap, in a good light; an assistant should stand behind, and hold the head against the chest of the nurse—a mouth-gag is not absolutely necessary, but it is helpful. Pass the curette in sidewise; then up as high in the centre of the vault as possible. Raise the handle, using the front teeth as a fulcrum. Make fairly firm pressure, sweeping it downward. Repeat these steps on either side. When finished, the curette slips over the smooth surface The child bleeds freely for a moment or two from the nose and mouth, but it never requires any special means to stop it.

Technic With a General Anæsthetic.—This method is much better, especially if there are faucial tonsils to be removed. A narrow table, with no pillow, is required for the patient. It is not necessary to have the child's head very low, or over the end of the table, such positions rather tending to cause venous congestion, and consequently, more bleeding. When any bleeding occurs, the child may easily be turned on its side. It is always well to have the patient thoroughly under the anæsthetic before doing any cutting (Fig. 38.) The mouth is now held open with a mouth gag, which is held by an assistant who also steadies the head for the operator. First, use the forceps, passing them, closed, behind the soft palate and up as high in the postnasal space as possible; allow them to open, (which the spring will do,) making fairly firm pressure against

the posterior wall. Now, bring the handle up against the front teeth and close them. Do not pull it immediately out, but make gentle rotation to loosen the piece which has been cut;

Fig. 38.

Mouth gag.

then remove the forceps, with the handle still closed. This removes the greater part of the tissue. Now employ the curette quickly in the same manner as described on previous pages. Turn the patient on his side, and wait for a minute or so for the bleeding to stop. Give a little more ether, go up once more, and carefully curette the whole space, being especially careful to remove any tissue at the sides behind the Eustachian tubes (the fossa of Rosenmüller). For this, the small forceps often answer very well.

If there should be enlarged faucial tonsils, it is preferable to remove them first, but that is a matter of choice.

There is always considerable bleeding, and some of it is sure to go down the throat; but is usually vomited up before the patient is completely out of the anæsthetic. It is always wise to tell the parents that such may happen, and have the nurse keep careful watch for the first hour or two, turning the patient on the side if it should occur. Fatal cases of hemorrhage have been reported, but they are rare. If the bleeding should continue for any length of time, it may be necessary to irrigate the postnasal space with astringent solutions, such as adrenal or alum solution or that very good astringent, an alcohol solution of tannin and antepyrine. In a few cases, if the

bleeding still persists, it may be necessary to apply a tampon, or plug the nose, as for severe epistaxis. Always be on your guard for bleeders. The patient should be kept in bed for one or two days and in the house for a day or two longer. The first night, the food should be milk, ice cream, soft boiled eggs, milk and toast, or liquid diet of some form. The following morning, the child may be put on regular diet.

It may be necessary to use a nasal wash for a few days. Usually no **after-treatment** is necessary. For a few days after the operation, the breathing may not be good. The pharynx is somewhat swollen, and the postnasal space more or less filled with clotted blood, and it will be necessary to use some mild alkaline wash to cleanse the nostrils. The ears must be carefully watched for a few days, for fear that the irritation caused by the operation may extend to the Eustachean tubes—sometimes a little blood is forced into them, and it is always necessary to be on guard against any such accident. If the breathing is not very much improved in the course of a few days, the patient should be examined carefully to see if all the growth has been removed. If this has been done, the cause of the faulty breathing must be some obstruction in the nose, and this, very frequently, will be the enlargement of the posterior ends of the lower turbinate bones. These cannot be seen very easily before the adenoids are removed, but when the postnasal space is cleared and the pressure removed, this large, polypoid-looking growth will be seen almost completely filling the posterior nares.

Artificial means such as straps or bandages, to keep the mouth closed during sleep, as a rule, are of very little benefit. One of the hardest things to overcome is the faulty speech sometimes noticed in children who have always had their postnasal space filled with tissue. This is especially so in adults, the palate, in these cases, having lost its proper tone and strength. The only manner of overcoming the defect is by study and education, placing the child under the care of a good teacher in voice production or singing.

Prognosis.—The prognosis is, as a rule, very satisfactory, but in cases of long-standing ear-trouble due to the presence of postnasal growths, one should be a little guarded as to the prognosis, as the results, as a rule, are not as good as in the younger patients.

When the patient is troubled with epilepsy or asthma, the breathing and general condition will be improved, but the

Fig. 39.

Gottstein's curette.

effect on the other troubles may be very slight. In the great majority of cases, the results are very satisfactory, and the child that formerly breathed in such a heavy, noisy manner will sleep peacefully. The recurrence of adenoids has been noticed in a few cases, but they are usually in children who have been operated on very young, and who are of a lymphatic diathesis; but in the majority of cases, the cause will usually be found to be incomplete removal of some obstruction to proper breathing in the nares. One of the chief causes of failure in this operation is that the fossæ of Rosenmüller have not been properly cleaned out, and in such cases a small curette is very useful (Fig. 39). Gottstein's curette, made in

three different sizes, is one of the most useful instruments for this operation. There are different forms and sizes of forceps, but the one most generally used is Brandegee's adenoid forceps (Fig. 40). This is made with one cutting-blade which fits inside the other blade (Fig. 40). Loewenberg's forceps is also very good, but the cutting part is rather short, and in many cases will not reach to the upper part of the postnasal space (Fig. 41). The Motais artificial finger is used by some operators, and is spoken of very highly. Meyer's ring-knife has some advocates, but it is not much used in this country. It is passed through the

FIG. 40.

Brandegee's adenoid forceps.

FIG. 41.

Lowenberg's adenoid forceps.

anterior nares, and, guided by the finger of the other hand, the postnasal space is curetted (Fig. 43).

In using any of these instruments, certain things have to be guarded against. The posterior end of the nasal septum may be wounded with the forceps. This is usually avoided by keeping the forceps against the upper teeth when closing; and, also, when putting them in place, always keep them closed. The Eustachean tubes may be wounded by tilting the forceps to one side or the other. They should be kept as near the center as possible.

AFFECTIONS OF THE SEPTUM.

Affections of the septum may occur in the following types:

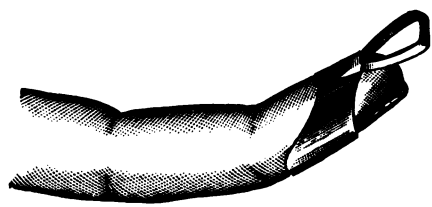
1. Deflections of the septum.

2. Exostoses or spurs on either side of the septum.
3. Abscess of the septum.
4. Perforation of septum.
5. Fracture of the septum.

DEVIATION OF THE SEPTUM.

Definition.—Deviation is the bending or curving of the septum to one side or the other, leaving one nostril very large and roomy, and occluding the other nostril, in part or totally. De-

FIG. 42.



Musson's finger curette.

viations of the septum take different forms in each case. No two cases are ever seen exactly alike, some being bent at a sharp angle, others gently curved, and in some there will be noticed a sort of double-curved surface, almost like the letter

FIG. 43.

Meyer's ring-knife for adenoids.

"S." These deviations very often take place at the junctions of the bony and cartilaginous parts of the septum, although the cartilage only may be affected; while in other cases, especially when due to traumatism, the bony parts also are affected.

Etiology.—This varies in many cases—and it is difficult tc give an entirely satisfactory cause. Frequently the patient will complain of an ordinary catarrh, never even thinking that there is any serious difficulty in the nose. In some cases patients have had a badly deviated septum for years, that has never given any particular symptoms. Traumatism in some form is a frequent cause, especially in young children, who often fall on the nose and are injured enough to bend the septum slightly; and, as they grow older, it tends to become gradually worse. High-arch palate shortens the space from the roof of the nose; thus the septum has not room for the proper development, and is crowded to one side or the other; and the deviation, once having been started, always has a tendency to become worse. Faulty respiration, due to adenoids and enlarged tonsils causing inflammatory action in the nasal mucous membrane, is also a factor. Some deviations are congenital; but some authorities state that it is seldom or never seen in children under seven years of age.

Symptoms.—There may be no particular symptoms, unless the deviation is very marked. The patient may complain of not being able to breathe through one nostril, or may only complain of catarrh. If it is a recent case, due to traumatism, the patient will often seek advice for the deformity, but in many old standing cases, the rhinologist is consulted for other symptoms, and finds that the direct cause of the catarrhal trouble is the nasal deformity.

On examination one nostril is found large and roomy, very often the mucus membrane is pale, or it may be more congested, due to the overworked condition of that nostril. The septum is not in the median line, but bent to one side, having a cavity on one side and a convexity on the otohr. The nostril with the convexity is almost closed, and in some cases the septum touches, and is adherent to, the outer wall of that nostril, and when the patient is asked to breathe out of the free nostril, a good volume of air passes through, but on the other side very little, or no air at all, will pass through.

Diagnosis.—Both nostrils may be obstructed by an abscess of the septum, or a large spur could obstruct one nostril; but in no other condition will you find one occluded nostril, with a concavity on one side and a convexity on the other. Cocaine produces no retraction of the swelling.

Treatment.—There are so many forms and varities of deviations, that it is impossible for any one operation to suit all cases. In some, the septum is very thin and sharply deflected; in others, very thick, when very much redundant tissue occurs. In all these cases the operation must be modified to suit that particular case, and what would suit for one case might not answer at all in the other. The object to be attained and hoped for in all cases is to get a good, free breathing space through each nostril; and, when the deviation is not extreme, and one finds a good, thick septum, he is often able to cut away enough of the redundant tissue to give a fairly good breathing space; in fact, the author prefers, when at all possible, to avoid breaking the septum—for, even when most careful, good results are not always obtained—and when by the aid of the saw and scissors, enough of the redundant tissue may be cut away to make a fairly good opening, the results are usually very beneficial. This does not apply to marked deviations of the septum, or to deflections at a sharp angle. Nothing but the radical operation will give the results required in such cases.

Asch operation, first described by Dr. Asch, and called by his name, is probably the best known operation for deviated septum. There are several others also well known: **Gleason's buttonhole or flap operation, Kyle's operation, Dr. Roe's method of straightening the septum, submucous operation,** and many other procedures; in fact, nearly every nasal surgeon has his own particular method of operating on the nasal septum.

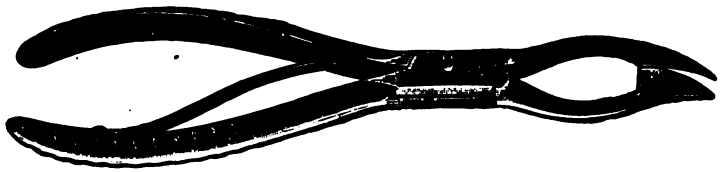
The **object of any septal operation** is to fracture the septal bones and cartilage, carry or push them to the median line, and hold them in that position until union takes place.

The **Asch operation** is probably the one most frequently

used. Special instruments are required. After the patient is thoroughly under a general anæsthetic, and the nostrils have been cleansed with some antiseptic solution, if anxious to have little bleeding, it is well to fill both nostrils for five minutes with cotton, saturated with adrenalin solution.

With the blunt separator, break up any adhesions between the septum and outer wall of the nose. The straight scissors

FIG. 44.

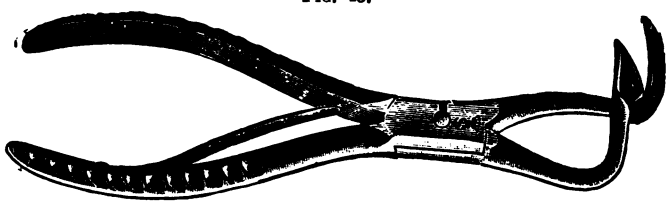


Asch's straight scissors.

(Fig. 44) are now introduced, the wide blade being placed in the concave side, and the narrow, blunt blade on the other side, over the most prominent point of the convexity, cutting parallel to the floor of the nose, and as near the floor as the convexity will permit.

The angular scissors (Fig. 45) are now taken, and placed in the nose with the points upward, and with the base of the

FIG. 45.



Asch's angular scissors.

blade as near the floor as possible. They are placed in such a position, that when the cut is made, it is at right angles to the first incision, and, is also through the most prominent point of the convexity; so that when the two cuts are made, they

make a cross, X, creating four small flaps. Now, take the blunt forceps (Fig. 46); place one blade in each nostril; grasp the lower part of the septum, and fracture it; then fracture the upper parts in the same manner. It is very important that these lower parts should be thoroughly fractured. Sometimes considerable force is required to do so; but if this detail is neglected the results of the operation will not be as good as otherwise. After being well broken and the resistance destroyed, the whole septum is carried to the median line by the forceps, or by placing a finger on the convex side, and pushing it well over to the concave side. The septum is now in the median line, and it is necessary to keep it there until the fractures heal and become fairly solid. Sterilized hollow tubes are the best for this purpose, using a fairly good-sized one in the narrow nostril, and a smaller one in the concave side, thus maintaining equal pressure. (Figs. 47 and 48).

Fig. 46.

Asch's heavy-forceps.

The operation now being finished, the bleeding, which is usually profuse, stops very soon after the plugs are put into position. The small tube may be taken out after forty-eight hours, but the large one should be worn for three or four weeks, being taken out every few days to be cleansed, and the nostril washed out. This same operation may be done under a local anæsthetic, using cocaine hypodermatically into the mucous membrane of the septum, and also up under the lip, at the same time placing in each nostril cotton saturated with

a solution of equal parts of adrenalin and ten per cent. solution of cocaine. This should be left in position ten or fifteen minutes before operating. It should not be attempted in this

FIG. 47

McKernon's hard rubber nasal tube.

FIG. 48.

Asch's nasal tube.

way in a nervous person, or, in fact, in any one who is not willing to stand considerable pain.

The Asch operation has been modified, in several ways, but all modifications give practically the same results.

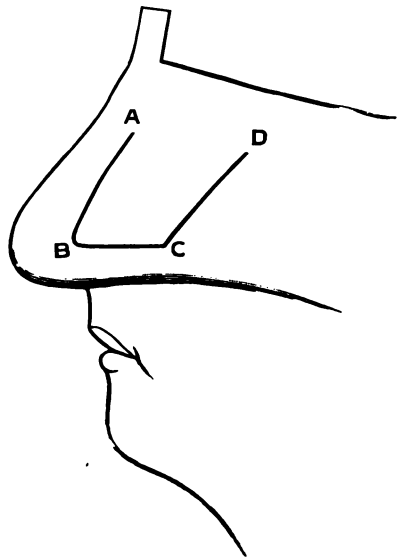
When the septum is thick, and, besides being deviated, has redundant tissue or a good sized spur on the convex side, it is always well to cut away some of this thickness with the saw or scissors, waiting for a few days for it to heal, before performing the operation for the deviation. In this way one of the chief difficulties to a successful operation may be overcome.

Another method which is very useful, in suitable cases, is the **operation of Kyle**, in which a file-like instrument is employed and one or two horizontal incisions are made through the mucous membrane, on one side, down to the cartilage and also through it, but not wounding the mucous membrane on the concave side. This V-shaped incision is made along the most prominent part of the deviation, and, if necessary, a parallel one is made just below it—diminishing the resisting power of the septum, so that, when the heavy forceps (Asch's tongs), are taken, it is comparatively easy to bend the septum over to the concave side. The sides of the shaped incisions come together, and allow the septum to assume a straight position. It is held in this position for a few days, until

healing takes place. This operation is suitable where the deflection is not very marked, or when it is rather a bend than a deflection. It is not suitable for sharply deviated septums, or when the concavity is very deep.

There is another operation for deviated septum sometimes called the **Gleason operation.** It is most suitable when the deflection is well anterior, and not of sharp angle. An incision is made in such a manner as to form a flap, which is then pushed through from the convex to the concave side. Make the first incision in the anterior part of the nostril, going

FIG. 49.



Gleason's button-hole flap operation. A B, the cut through the cartilage: B C, the cut along the floor of the nose, below the deviation: C D, the upward cut through the cartilage and bone.

through the cartilage with a small bistoury, and carrying it from the upper part of the septum downward to the floor of

the nose. Then, with the same short knife, carry the incision backward, below the deviation, and as near the floor of the nose as possible. As soon as the incision is back far enough, or beyond the deviation, turn the knife, and cut upward. At the upper part of this incision, it may be necessary to use a saw to complete it, on account of the density of the septum at that point. The incision is now almost like the three sides of a square, the only part not being cut through being along the upper part, or ridge, of the nose. (Fig. 49.)

With the finger, push the flap from the convex side through into the concave, and, as the edges are cut partially on the slant, it does not spring back when once pushed through carefully, but rests against the septum, on the concave side. A tube may be placed in the concave side for a few days, but, as a rule, it is not necessary. The healing takes place, and the results, in suitable cases, are usually very good.

The **after-treatment** in this operation is the same as that in the others. The nostrils should be kept clean by antiseptic washes and powder, until healing takes place.

The **submucous operation** or **the submucous resection of the nasal cartilage** consists in removing part or all of the deviated cartilage beneath the mucosa and allowing the mucous membrane of each side to remain in contact. In certain cases it gives splendid results, but they have to be selected; and it is not so suitable where the septum is sharply deflected, for it is difficult to separate the mucous membrane without a preparation. Inguls, Killian, Freer, and Bellanger, have each devised special instruments for this operation.

The same preparations as in other nasal operations are necessary. The opening incision is usually made on the left side, as this allows the better use of the right hand. With a special knife or ordinary bistury make an incision through the mucous membrane, beginning at the floor of the nose and extending it upwards and forwards, just a little behind the anterior end of the cartilage. Now take the elevator and separate the mucoperichondrium from the

septum back beyond the point of greatest deflection. Place the index finger in the right nostril, and with a sharp curette make an opening through the cartilage the length of the original incision, but being careful not to perforate the mucous membrane on the right side. Now place the elevator in this opening and carefully separate the mucoperichondrium from the right side back as far as it is separated on the left. The Killian speculum is now placed in the opening with one blade on each side of the septum; this will give a good view of the cartilage with the mucous membrane separated on either side. The next step is to remove all the deflected cartilage, which may be done with a pair of scissors and strong cutting-forceps, or better still by the Bellanger swivel knife. The nostrils are now cleansed and lightly packed with an antiseptic gauze to prevent bleeding and to keep the two mucous membranes in contact and in the median line. The dressing may be kept in for forty-eight hours and afterwards the nostrils cleansed daily with some alkaline wash until healing takes place.

EXOSTOSES.

Definition.—Exostoses are ridges, or spurs, which appear on the sides of the septum, and may be composed of cartilage or bone, or partly of each.

When it involves only the cartilaginous part of the septum, it is called an ecchondrosis, and when it is situated farther back, involving only the bony part of the septum, it is called exostosis.

It is not usual to see a spur begin in the cartilaginous part, and, extending back, involve the bony part as well. They are seen in all shapes and varieties, no two being alike, and are found in different positions—some near the floor so close, in some cases, as almost to involve the floor, in others, the ridge being much higher up on the septum.

Diagnosis.—This is usually easy, especially of an ecchon-

drosis; there is a thickening on one side of the septum, which partly occludes the nostril; while in the other nostril the septum will be found perfectly straight, with no concavity to correspond with the spur on the other side.

Fig. 50.

Curtis' straight saw.

It is sometimes harder to diagnose an exostosis—it being situated farther back, and often hid from view by an enlarged lower turbinate bone. The use of a little cocaine may be necessary. The growth is hard, and does not shrink by the use of cocaine.

Symptoms.—The patient seldom complains about any spur, unless it is large enough to obstruct breathing. He may seek advice for his catarrh, or inability to breathe through one nos tril. This nostril is usually the large open nostril, that is doing all the work, while the other one is found to be stopped up by the spur.

Sometimes the exostosis, situated far back, may not be large, but it is often an indirect cause of many catarrhal symptoms.

The **cause** of these spurs is very indefinite. The cartilaginous spur is, no doubt, often due to traumatism; but that can hardly be the cause of the exostosis because it is situated far back, and is well protected from any injury.

Treatment.—It is not always necessary to remove these spurs. Frequently, in a large roomy nostril, it is not necessary to remove even a large spur. *A spur should always be removed, however*—1, if it is large and interferes with free breathing; 2, if it extends far, and is in contact with the lower turbinate bone; 3, if it is situated near the floor of the nose, and interferes with the proper drainage of the nose;, 4. if it is situated higher up on the septum, and obstructs the ventilation and drainage of the upper part of the nostril. If the spur is small and due more to a thick-

ening of the mucous membrane than a bony thickening, it can be removed or shrunk up by fused crystals of chromic acid, or the careful use of cautery. These methods are seldom used, however, at the present time, removal with a saw being preferred.

The instruments necessary for the operation are: a short, thin-bladed saw, the cutting edge being one and one half

Fig. 51.

Rice's saw, with reversible blades.

inches long. For the saw, this will answer all purposes. Some, however, prefer the bent-handled saw, shown in Fig. 50, 51 and 52, because the handle, being bent downward, does not obstruct the view while working. Others like the beveled-edge saw. Of these two are required, one for each side.

The author prefers the short, straight saw, with a sharp cutting edge and a rather stiff blade. Besides the saw, are

Fig. 52.

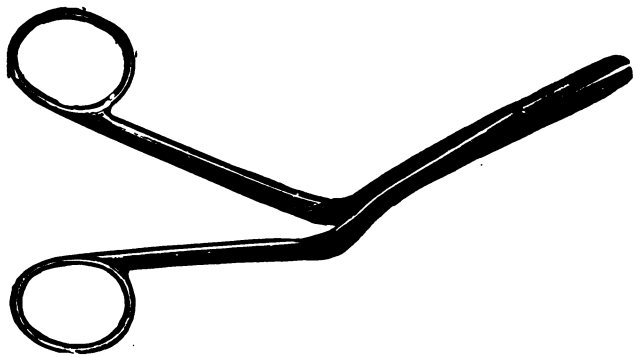
Casselberry's curved saw.

required a pair of curved scissors, strong, and sometimes with one blade serated, and a pair of curved forceps. These are made with cutting blades. If only one blade cuts, it will be necessary to have one for each nostril. (Fig. 53 and 54).

Operation of Removing Spurs.— After cleansing the nose with antiseptic solution place a piece of cotton, with a ten per cent. solution of cocaine, carefully over the spur, care being taken to see that the cotton extends the full length and covers all the portion to be cut off. This should be left in position

for five or six minutes. If anxious to perform a bloodless operation, remove the cocaine after five minutes, and place a similar piece of cotton, saturated with adrenal solution, carefully over the whole extent of the spur, and allow it to remain for five or ten minutes. After this is removed, the nostril is again cleansed, and the patient placed in a good light, with his head perfectly level and slightly turned to the side to be operated upon. It makes very little difference whether the

FIG. 53.



Pair of strong curved scissors.

sawing is done from above downward or from below up, but usually it is more convenient to saw downward. The saw is placed at the proper point for making the incision, but it is first applied at an angle until the mucous membrane is cut through; then it is changed to a vertical position, until the spur is cut off. It is well, before the sawing be started, to make an incision with a bistoury along the underside of the spur. This prevents the mucous membrane from being stripped off by the saw. As soon as the operator feels that he has cut through the bone and cartilage, the remainder may be cut with the scissors. The sawing is now completed, and the spur removed with the forceps, any ragged part of the wound being trimmed with the curved scissors. The bleeding, which may be quite free, is usually quickly stopped by covering the

wound and nostril with an antiseptic powder, such as compound stearate of zinc and boric acid, the patient not being allowed to sit with the head bent forward or backward. A clot forms quickly on the floor of the nose, and the bleeding is stopped.

In cases where the bleeding is very free, the patient should remain in the office for an hour or more; and every few minutes a little antiseptic powder should be puffed in. This will usually control the hemorrhage. When the bleeding is very severe, it may be necessary to plug the nose, for which purpose a Bernay's sponge should be used. The sponge is placed in the nose dry, exactly over the cut surface, if possible. The moisture of the nose quickly causes it to swell, and thus pressure is made on the bleeding point. It may be allowed to remain in the nose for thirty-six to forty-eight hours.

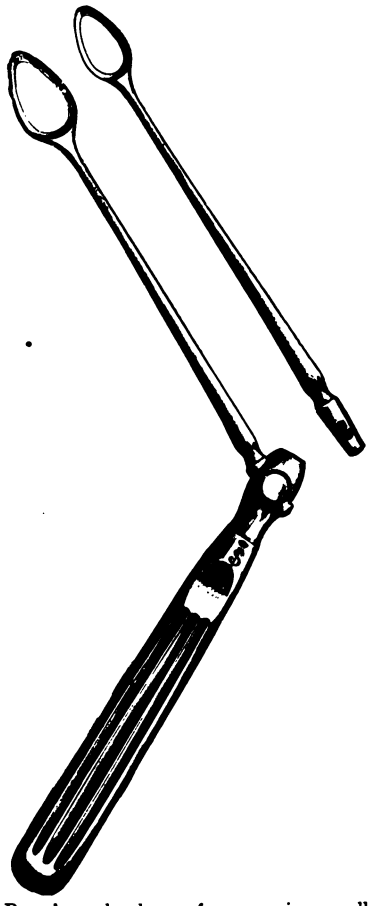
FIG. 54.

Pair of forceps with cutting edge.

After-treatment of Spurs.—The patient should remain in the office for a half hour, or until the bleeding has ceased. Prescribe the powder, and a powder-blower, with instructions not to blow the nose or wash it, but to puff in a little powder every hour or two, for twenty-four or thirty-six hours. While puffing in the powder the patient must always hold the breath, or the powder may get into his larynx, and cause him to cough. After two days, he should come to the office, and, if the wound has done well, one will find a clean, healthy

wound, with a dry scab over the surface. The use of the powder may now be discontinued. If there has been reaction, and the nose is swollen, it should be examined carefully, and a small probe passed over the cut surface, to be sure that there are no adhesions forming, and the patient should be directed to use the powder a day or two more. After this, if the healing process is slow, it may be well to wash the nose once daily with an antiseptic wash. When the sponge has been used, it must be removed carefully, employing cocaine and oil spray so as to pull it out, if possible, without starting the bleeding. The patient will now use the antiseptic powder for a few days. One important detail is to always have the patient come to the office within three or four days after the operation Otherwise, an adhesion may take place which would be more harmful than the spur A spoke-shave (Fig. 55) is used by some operators for removing small obstructions. After using cocaine, the knife part is placed in the nostril, over the spur, and then pulled

FIG. 55.



Beren's spoke-shave, for removing small spurs or smoothing rough portions of the septum.

firmly and quickly forward. This method of treatment works very well if the part to be removed is not large, and is composed of cartilage and mucous membrane. It is not serviceable for removing a bony spur. The dental drills, or burrs, and the galvanic cautery, are now seldom used in operations on the septum.

ABSCESS OF THE SEPTUM OF NOSE.

Definition.—Abscess is an infectious disease of the septum, or, phlegmonous inflammation of the septum.

Pathology.—The septum is composed of two plates of cartilage and bone; the mucous membrane over this becomes broken by an injury, or blow of some kind, and becomes infected; inflammation takes place and pus is formed. This increases in quantity, and, acting as a wedge, spreads the two sides of the septum apart.

Symptoms.—The symptoms are the same as those of an abscess in other parts of the body; chill, fever, redness, pain, swelling, and distension. Both nostrils are occluded, and the patient is compelled to breathe through the mouth. **On examination,** both nostrils will be found occluded by a soft, spongy swelling. Its appearance is that of a markedly deviated septum, but the same condition is found on each side of the septum.

Treatment.—The treatment will be the same as that of any abscess—a free opening in the most dependant part. It is important to make the diagnosis early, and to open promptly; otherwise considerable damage to the septum may result. It is important to make the incision free, and as near the floor of the nose as possible, in order to insure good drainage. The incision should be kept open by placing a small piece of iodoform gauze in the opening. After using cocaine, the incision is made with a small bistoury the pus evacuated, the cavity washed and cleaned with peroxide of hydrogen, and boric acid water. The gauze is taken out in twenty-four hours, and the abscess-cavity is washed and cleansed again.

Usually a free opening on one side will be sufficient, but when the pus is very extensive, it may be necessary to make an opening in the other side. After a few days, when the pus has been stopped, a little pressure should be made on each side of the septum, so that its two plates will be held together, and adhesion take place. This may be done by packing each nostril with gauze, or a Bernay's sponge, for two or three days. Hard-rubber tubes, or even a spread clamp, may be used. With care the abscess heals, leaving the septum in good condition.

FOREIGN BODIES IN THE NOSE.

Sources.—Foreign bodies such as peas, beans, buttons, and the like, are often placed in the nose by young children. In adults they are more likely to be the result of accident. The most common accident being, that some substance is forced into the postnasal space by violent coughing or sneezing.

Symptoms.—Foreign bodies may long remain in the nostril without giving much trouble. Those of vegetable nature absorb moisture, swell, and cause much pain, tumefaction, and discharge. After the acute irritation passes away, a purulent, or mucopurulent rhinitis may follow.

If the foreign body is of hard nature, it may remain many years, and, from the deposits of mucus which collect around it, gradually increase and harden, the whole forming a sort of a calcareous substance which is called rhinolith.

Diagnosis.—The diagnosis will depend much on the history; but in a child, with a profuse watery discharge, (especially from one side of the nose), with a red inflamed nostril, and a constant picking at the nostril, a foreign body is to be suspected. In adults, a definite history of something getting into the nostril is usually stated. In old cases, the patient will usually seek advice regarding his catarrh, or inability to breathe through one nostril, or very offensive odor; and will be much surprised to learn of the foreign body

in the nose. On **examination**, the nostril will be found filled with stringy mucus, and, on removal, a whitish looking object will often be seen in the nostril. If the mucous membrane is much swollen, place a little five per cent. cocaine upon it for a few minutes. This contracts the membrane, opens the nostril and enables one to see better. A probe will come into contact with some foreign object which is hard, firm and does not move when touched; if a polyp, it will be soft, and easily moved about, when touched with the probe.

Treatment.—The only treatment is the removal of the object. Cleanse the anterior nares, and place a ten per cent. solution of cocaine in the nostril containing the foreign body. This should be left in for five or six minutes. When removed, the mucous membrane will be found contracted; and the object is, usually, easily seen. If the object is round, and smooth, it may be removed by blowing the nose hard. Douching the free nostril with warm water will sometimes dislodge it, using a Politzer's bag, and making two or three quick puffs into the free nostril. If these procedures are not successful, the patient should be placed in a good light; the nostril moistened and lubricated with some oil spray; and the object removed with narrow pair of forceps; or, if it is far back in the nostril, and the nose is very small, it may be

FIG. 56.

Small nasal hook for removing foreign bodies from the nose.

removed with a small nasal hook (Fig 56). When the object is large, a heavy forceps may be required to break it. The pieces may then be removed.

RHINOLITHS.

Definition.—Rhinolith is the term applied to a hard, irregular substance found in the nose. It is usually due to a foreign body, forming a nucleus, around which salts of lime become deposited, thus causing a hard, calcareous mass.

This nucleus is sometimes formed by the hard, dry secretions of the nose. Rhinoliths occur usually singly, are of a blackish color, gradually become larger, and are sometimes imbedded in the surrounding tissue, causing more or less ulceration. The growth is slow, and the symptoms are chronic, extending over a considerable period of time. As the rhinolith increases in size, the pain is more marked, the discharge becomes purulent, and there may be considerable ulceration and necrosis.

Treatment.—The treatment consists in the removal of the stone.

Use cocaine to shrink the surrounding tissue as much as possible, and then remove the rhinolith with the ordinary nasal forceps. In some cases, it may be necessary to use bone forceps to break the hard substance, and then remove it piecemeal.

In cases where it is situated far back in the nostril, the rhinolith may be pushed backward into the postnasal space, and be taken out through the mouth.

A mild antiseptic wash, with a douche-cup, should be used for a few days, and the nostril lubricated with an oil spray or vaseline or cold cream.

EPISTAXIS.

Synonym.—Nose-bleed.

Definition.—Epistaxis is a bleeding from the nose.

Diagnosis.—The diagnosis of epistaxis is usually very easily made; the chief trouble lies in locating the point from which the blood comes, and in finding the cause of the bleeding.

Causes.—1 Injuries from blows, or falls.

2. Local affection of the nasal mucous membrane (such as hyperæmia), or from ulceration due to foreign body or growth of some form.

3. Systemic affection: anæmia, Bright's disease, cirrhosis of the liver, pneumonia, typhoid fever, measles, etc.

4. Vicarious epistaxis, occurring during the menstrual period.

In the majority of cases **the bleeding comes from** a small erosion or ulceration on the anterior part of the septum near the floor of the nose. The patient picks the nose, or blows it hard, or has a violent attack of sneezing, the scab is knocked off, and bleeding occurs. It may come on without any particular warning, and bleed very freely for some time. The patient comes to the physician (the bleeding having stopped), and the parts are so blanched that he may have difficulty in locating the bleeding point.

In making an **examination,** it is well to remember that nearly all bleeding comes from the anterior part of the septum.

Nasal bleeding is sometimes caused by a severe injury to the head, and, if the skull is fractured, blood may flow from the ears, as well as from the nose.

Sudden nose bleed in a person past middle life should be looked upon with suspicion, as it may be an indication of some organic disease. The heart should be examined, and if any venous congestion is found, the indication is for heart tonics, nitroglycerine, strychnine, etc.

It is seldom necessary to plug the nose for this form of bleeding, although it may be necessary to do so until the heart tonics begin to take effect. Fatal nose-bleed is very rare, but it may occur in hæmophelia, or in a person whose general health is very low.

Treatment.—Locate the bleeding point if possible, and, if the nose is bleeding freely, wash it out with peroxide of hydrogen; this alone sometimes stops the flow. Apply ice to the outside of the nose. Do not let the patient bend the head down or back. Pinch the nose with the thumb and finger. If these simple methods do not control, use one of the following methods:

℞.
Cocaine (five per cent. solution)
Adrenalin . . . . . āā ℥ i.
Mix, and make a solution.
S.—Fill the bleeding nostril with cotton saturated with this solution.

Another good styptic is—

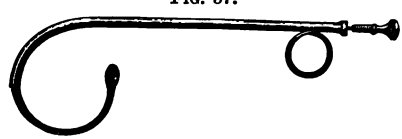
℞.
Tannic acid . . . . . gr. x.
Gallic acid . . . . . gr. xx.
Water, up to . . . . . ℥ i.
Mix, and make a solution.
S.—Saturate cotton, and place it in the bleeding nostril.

A valuable styptic, in powder form, is—

℞.
Pulv. fol. meatico
Pulv. amyl . . . . . āā ℥ i.
Mix, and make a powder.
S.—Use in a powder-blower, and puff up the nose every half hour.

An attempt should be made to control the bleeding by plugging the anterior nares. This should be done with narrow strips of sterilized gauze, placing the first piece as far back in the nostril as possible, then, with a narrow pair of forceps, pushing in a little at a time until the nostril is filled. Have the gauze narrow, about a half-inch wide.

FIG. 57.



Bellocq's cannula.

This will insure a firm, solid plug. If the bleeding still continues and can be seen flowing down the pharynx, it will be necessary to plug the posterior nares as well as the front. This is done by passing a Bellocq's cannula, (Fig. 57) or a soft-rubber catheter, along the floor of the nose until its end is

seen passing down behind the soft palate into the pharynx. It should then be grasped with a pair of forceps and pulled forward into the mouth. A string is now tied to the end, and the catheter pulled back through the nostril. There is now a string which passes through the nostril, down behind the soft palate, and out through the mouth. Next, take a pledget of cotton, as near the size of the posterior nares as one may judge—it is important to have the plug as large as possible; tie the string to this, and gently pull the end that is in the nostril. This will pull the plug into the postnasal space. Hold this same end firmly, and, with a pair of forceps, fill the anterior nares with strips of gauze, pushing them back against the posterior plug. The end of the string which is still in the mouth may be fastened to a tooth, or to the side of the cheek, with a small piece of adhesive plaster. The plug should be left in position not more than forty-eight hours, and, before removing, it should be thoroughly softened with oil or vaseline. The anterior part is removed first, gently and carefully, then, with a little cocaine and more oil, the posterior plug is softened, and is removed by pulling the end of the string which is in the mouth.

Another very useful way of controlling hemorrhage, especially if it is situated in the anterior part of the nose, is by the use of nasal plugs of Bernay's sponge. These may be cut to any size, and placed in the nostril. They absorb moisture quickly, and expand to about three times their original thickness. Iron solution should not be used in the nose, as it makes a hard, black clot that is very painful to remove.

When the cause is due to some irregularity in the general health, this must be attended to. See that the liver and kidneys are in good condition, and the general health should be built up. In very full-blooded people, where loss of blood is indicated, it is not always well to stop it quickly, but rather, to use ordinary simple remedies, such as lying down, hands raised over the head, cold applied to nose and head. After the bleeding has stopped, or when only a slight oozing is

noticed, and the bleeding-point is to be located, place the patient in a good light, and examine carefully the anterior septum and floor of the nose. A small scab, or ulceration, will usually be found, though sometimes only a bright red spot is noticed, which, if touched with a probe, will start the hemorrhage. If there is a general oozing, paint the spot with a solution of nitrate of silver; this will whiten the mucous membrane, and the bleeding-point will show by a bright red spot on the white surface. After the spot has been located, use a five per cent. solution of cocaine on cotton, and, with the galvano-cautery at a dull heat, completely sear over the bleeding artery, keeping the nostril well covered with a powder for two or three days.

If the patient, when first seen, has the nose filled with cotton, care should be used in removing it. Soften it well with cocaine and an oil spray, and remove it very gently, to prevent the hemorrhage from starting again. This is one of the purposes for which a cautery is most advisedly used. Strong silver solutions, or chromic acid, may be used; but the cautery is much more convenient and more successful.

NASAL SYPHILIS.

Synonyms.—Syphilis of the nasal fossæ, specific rhinitis, syphilitic rhinitis.

Primary lesion is seldom seen in the nose, but a few authentic cases have been reported. When a small, indurated ulceration is noticed, either on the septum or on the turbinate bones, accompanied by an enlargement of the glands at the angle of the jaw, it should be treated with suspicion.

In the **second stage** we get mucus patches and more or less superficial ulceration, which may extend, and cause considerable deformity.

The **tertiary stage** is marked by more extensive ulceration. It may begin in the form of a gumma, which becomes inflamed, breaks down, and ulcerates. In other cases, the

inflammation seems to begin in the bone, causing necrosis of the bone and extending to the mucous membrane, causing a deep ulceration.

Significance.—On account of the great deformity which may take place and the horrible cases one so often sees, both in the congenital and acquired forms, it is very necessary that all cases should be early diagnosed and most carefully treated.

In young children, the early recognition of this disease is very important, and, if carefully treated, the results are usually very gratifying.

The primary and secondary lesions do not require any special local treatment, except to be kept absolutely clean.

In the tertiary period, if seen early, the great destruction of tissue, and the subsequent deformity may be prevented by placing the patient promptly under the influence of the constitutional treatment.

Symptoms.—The patient usually complains of cold in the head, sneezing, headache, and loss of smell.

The secretions are abundant and watery, and, upon looking at the mucous membrane, it is seen to be red, swollen, and, in some cases, almost enough to cause stenosis; but the swelling is sensitive, yields to the pressure of the probe, and bleeds easily. Shortly after this condition is observed, an ulcer is formed, which quickly breaks down and spreads, extending to the cartilage and bone. At this stage, we get the peculiar bloody discharge and characteristic odor of dead bone, which is one of the chief means of distinguishing between the syphilitic condition and simple ulceration of the septum. The voice usually has a peculiar nasal quality. The ulceration spreads, and either the whole septum may be destroyed, or, merely the cartilaginous part.

Very often the palate bones become necrosed, and a small perforation in the hard palate may appear. When the bony septum has been necrosed, we are apt to get great deformity. The bridge seems to disappear, and the nose becomes wide

and flat ("saddle nose"). Considerable destruction of the bony cartilage may take place without much deformity resulting.

Prognosis.—The prognosis in all these cases should be stated carefully, and, when any necrosis has taken place, it is well to warn the patient of the danger of deformity.

If the ulceration has not extended to the bone, much may be done by the constitutional treatment, but when necrosis has taken place, the treatment is much more difficult and the prognosis more doubtful.

Treatment.—In the primary, and secondary forms, cleansing washes, such as borolyptol, boroformalin, etc., are all that is necessary for local treatment. The constitutional treatment is very important; saturated solution of iodide of potash should be prescribed, beginning with ten drops in milk or vichy, two hours after each meal.

In the late stages, cleanliness is also important, and the crusts and scabs should be removed as carefully as possible, so as not to start bleeding, or excite any further inflammatory action If the ulceration is not very large, one of the following solutions, applied carefully with cotton on an applicator, will be found very useful:

℞.
Iodol . . . . . āā ʒ i.
Oil of sassafras . . . . . ʒ i.
Ether
Mix, and make a solution.
S.—Apply on cotton applicator.

Or—

10 per cent. watery solution of nitrate of silver.

If there is a profuse, irritating, watery discharge, it is well to have the patient use the following powder:

℞.
Compound stearate of zinc and iodoform . ʒ i.
S.—Puff a little into the nose every hour, for a day or two.

When the secretions are thick and hard, do not use a powder, but soften them with some form of oil spray, *e. g.*,

℞.

Carbolic acid	♏ xv.
Camphor	gr. v.
Liquid albolene	℥ ii.

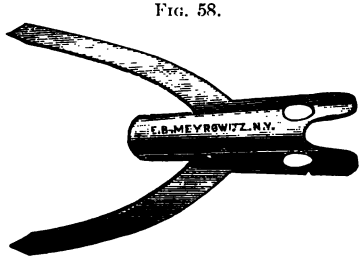
Mix, and make a solution.
S.—Use in an oil atomizer.

When there is much swelling, or the breathing is obstructed by any form of exostosis, it is not well to do any cutting, for fear of increasing the danger of necrosis.

If, on examination, dead bone is found, we have at once to decide what is best to be done. When the amount is large and loose, it must be removed by forceps. Occasionally the sequestrum is so large that it cannot be removed through either nostril. If it cannot be broken by the forceps, and removed in pieces, it will be necessary to make an opening by an incision under the lip, separating it, and throwing the nose upward so as to expose the nasal fossæ.

It is always very necessary, at this stage to quickly place the patient under the influence of constitutional treatment. Begin with ten-drop doses of the saturated solution of iodide of potash, in a half glass of water, two hours after each meal.

FIG. 58.



This should be increased a drop each day until signs of iodism are produced. At the same time, especially if it is an early neglected case, it is well to give one mercury protiodid

pill, one-sixth grain, three times each day, or calomel, or by inunction, or fumigation.

The patient should not be allowed to use any alcohol, and very little, if any, tobacco; but a good, generous diet should be prescribed, with tonics, plenty of fresh air and sunshine.

Several methods have been tried for the correction of the deformity caused by the necrosis, one of which is a hard-rubber nasal support, used by Bishop; another, a Martin's artificial bridge. (Fig. 58).

These have been used in serious cases with fairly good results, but in all cases it is better to have the patient undergo a long course of specific treatment before any operative work is tried; otherwise the tissues may not be in good condition to repair easily, and the operation may result in irritation and ulceration.

FIG. 59.

Cut of syringe for paraffin injection.

Since the use of paraffin has been tried in the correction of these deformities, several very gratifying results have been recorded. Of course, it cannot be used in every case, and the best results are obtained in the correction of the saddle, or flat nose. The nose should be thoroughly cleansed, and a few drops of four per cent solution of cocaine should be injected under the skin at the point at which we wish to use the paraffin. It is necessary to have a special syringe, strong, powerful, and one in which the piston can be worked with a screw if necessary. The needle should be as large as possible. (Fig. 59.)

Some recommend the use of paraffin at a melting point of 110°F., while others, especially those using the screw piston, prefer to use the paraffin in a semisolid condition. If there should be much reaction after the injection, it is well to apply cold compress to the nose, for an hour or two. When the deformity is very marked, the injection of paraffin may be repeated two or three times, several weeks apart, until the deformity is corrected. This is better than trying to inject very much at one sitting.

FIBROMATA OF THE NOSE.

Fibromata occur almost always in young people, seldom in a person over twenty-five or under ten, and are usually confined to the male sex. They appear as a hard, firm growth, usually single, attached to the body of the sphenoid bone and extending into the posterior nares. This grows very rapidly, and may be as large as a small orange. When it grows large, it often becomes attached to the outer wall of the nose, making the nose very wide, and giving it a peculiar shape. Extensive adhesions are often set up, and the growth may extend and involve the antrum, even the orbit, causing the eyes to bulge out; in a few cases it has been known to extend to the brain. For these reasons, an early diagnosis is very important.

Pathology.—The fibroma is of very dense structure, with a smooth surface. It contains elastic fibres, and is covered with a layer of mucous membrane. It contains numerous arteries and veins, which, on account of the firmness of the growth, do not collapse when cut, and may result in severe bleeding. It contains numerous spindle-cells. It, also, may undergo changes, such as ulceration and suppuration, due to pressure or irritation.

Symptoms.—Cold in the head, sneezing, inability to breathe, slimy discharge from the nostril which in time becomes purulent. A persistent catarrh which gradually grows worse. The hearing often becomes affected. The speech becomes thickened and the patient complains of drowsiness, and great fatigue, and will often fall asleep sitting up. He will often have persistent vomiting, and severe attacks of nose bleed which will sometimes require plugging. Intense neuralgic pains are frequent.

On examination, either with a postnasal mirror or by lifting the soft palate, a smooth, round tumor is seen, whose color varies from pale to dark red. Not much may be seen through the anterior nares. They are filled with fibrous polypi which are rather dense and firm, but which bleed easily when touched with a probe or applicator.

Diagnosis.—We have a dense neoplasm with a smooth surface. If it were a polypus, we would not find such grave symptoms nor such deformity as sometimes develops. Sarcoma may resemble it very much, but the age of the patient will aid you, and it is always well, in a serious growth like this, to get a small part of it for a microscopical examination.

The **prognosis** is favorable when seen early, but when it has increased to any great size, and involves the antrum or orbit, it is almost impossible to get a satisfactory result.

Treatment.—The treatment of nasal fibromata is thoroughly to remove the growth, either by cold wire-snare, very strong forceps, ligation, cautery, or electrolysis. When they are very large and involve the antrum or orbit, their removal will re-

quire more extensive operations described in surgical works. The simplest manner is by the use of the cold wire-snare. This may be done by using a curved snare, passing it up behind the soft palate and coaxing the loop of wire over the growth; but when the growth is not too large, a straight snare, like a Jarvis, (but made very strong), may be used to advantage. The loop is passed through the nostril into the post-nasal space. One is able to free the loop by putting the finger behind the palate, and, at the same time, slipping the loop over the growth and pushing it upwards as far as possible. Begin slowly to tighten the wire by turning the screw, and the wire will usually slip towards the pedicle, so that the growth may be slowly cut through by shortening the wire. One must always be careful to have a strong instrument and strong wire.

Some authorities speak well of the use of the electric cautery, the practice being to make three or four punctures in the growth, repeating the process in a few days. This is done with the hope of destroying the bloodvessels, and shrinking the tumor.

Electrolysis is also well spoken of by some who claim to have had good results from this method of treatment.

SARCOMA OF THE NOSE.

Carcinoma and sarcoma are, fortunately, rather rare, and statistics seem to show that sarcoma is more frequently seen than carcinoma.

Sarcoma is usually of the round-cell variety, and may occur at any age, but generally before the age of forty years. It occurs more frequently in men. It may have its origin in the nasal chambers but it often begins in the surrounding tissue, and spreads to the nasal cavity, where it frequently causes great deformity.

Symptoms.—The early symptoms are occlusion of the nostril, a mucopurulent discharge which is usually offensive, and, as the growth increases, great pain and deformity.

The use of a microscope is very important in making a diagnosis, and often three or four examinations will have to be made before the nature of the growth is fully determined.

Treatment.—Early and complete removal presents the only chance of recovery, and this is only practicable when the growth is confined to the nasal fossæ, and may be reached with the cold wire-snare.

CARCINOMA OF THE NOSE.

Carcinoma occurs extremely rarely as a primary affection, but may invade the nose from the surrounding parts. It is the epithelial variety, beginning as a small nodule which tends to ulceration. It is usually found in the anterior part of the nose, that being the part most exposed to irritation. It grows rapidly and may extend to the antrum and orbit.

Symptoms.—A purulent discharge with a peculiar color and odor. Impairment of the breathing, peculiar lancinating pains, and gradually increasing cachexia. As the growth increases in size, all these symptoms become more marked. Severe hemorrhage on slight provocation occurs frequently. It is very necessary to make a microscopical examination of the growth. When there is any doubt, it is always well to try antiseptic remedies for a short time.

Treatment.—If seen early, it is possible to remove the growth by operation, but it is always a very serious one, and the growth is very apt to recur. Most practitioners do not favor operations, although some have reported favorable results in a few cases.

PAPILLOMATA OF THE NOSE.

Nasal papillomata consist of wart-like growths—comparatively rare, but, when found, usually attached to the inferior turbinate bone, or septum. They are well supplied with bloodvessels and often bleed freely when cut.

The **treatment** consists in removing with a snare, and cauterizing the bone with the galvanocautery, or with fused chromic acid, and then keeping the surface well covered with compound stearate of zinc and boric acid powder, till healing takes place. The powder should be used with a powder-blower four or five times each day for a few days.

DISEASES OF THE AUXILIARY SINUSES OF THE NOSE.

Sinusitis.—The **accessory sinuses of the nose** are so closely connected with the nose, that they are subject to the same inflammations, which may, for convenience be divided into acute and chronic sinusitis.

Acute sinusitis may occur at any time with an acute cold in the head, and may be due to the mucous membrane of the nose becoming swollen and damming up the ordinary secretions of these cavities, or, it may even be due to direct infection. Traumatism often causes it. It is also found in cases of diphtheria, typhoid fever, and erysipelas.

Chronic sinusitis may be the result of an acute attack. A unilateral discharge of pus is nearly always indicative of sinus disease, although both sides are affected in some cases. It is not always a constant discharge, and is affected by the position of the head; for instance, after clearing the nostril and having the patient bend the head forward and downward, pus will usually be seen flowing from the middle meatus, and, from the position of the pus, we judge which cavity is affected.

When the patient lies down, this discharge of pus flows backward, causing a disagreeable taste in the mouth, with more or less gastric disturbance.

MAXILLARY SINUSITIS.

The **maxillary sinus**, or **antrum of Highmore** is the largest and most easily reached, and is supposed to be more frequently

affected than the two others; but it is found that both the frontal and ethmoidal cavities are affected nearly as often.

Anatomy of the Antrum.—These antra are two pyramidal cavities, situated in each superior maxillary bone. The roof of each is formed by the floor of the orbit; and the floor, by the roof of the mouth. The cavity varies in size, holding from a drachm to an ounce. There is a circular opening in each inner wall, through the middle meatus of the nose, about the middle of the inferior turbinate bone. Each superior dental nerve passes through each antrum, along the floor, to the teeth. A few of the roots of the teeth may extend into the antra. The mucous membrane, lining the cavity, is much the same as that in the nose, only thinner. The mucosa of the antrum is subject to acute, and chronic inflammation.

Causes.—The causes are usually due to a form of infection from the nose. It may also be caused by traumatism or infection from any decayed tooth, the first or second molars being the ones that usually cause it. If the inflammation be merely a simple one with no infection, which may be caused by simple rhinitis and the closing of the natural opening by the swelling of the mucous membrane, it should be treated as a simple inflammation. Cold applied externally, antiseptic nasal sprays, cocaine applied over the lower turbinate bone, should be used, in the hope of shrinking the mucous membrane enough to allow any secretions to pass out of the natural opening. The inflammation quiets down and the patient is well in a few days. If the cavity becomes infected from any cause, the condition is much more serious, and must be treated more actively.

Chronic suppurative inflammation of the antrum is also called **empyema of the antrum.** In looking for the cause of the disease, we are at a loss to decide exactly. In some cases it is the result of acute inflammation in the nose, extending to and infecting the mucous membrane of the antrum. Many of the cases are supposed to be caused by caries of the teeth, and, while no doubt many of them have their origin in this

source, it is given as a cause much more frequently than it should be

Symptoms.—A dull aching pain over the region of the antrum. The fever is not high, except in very acute cases. The swelling varies in different cases, but there is likely to be some swelling of the face on the affected side, and considerable tenderness on pressure. The eyeballs may protrude, due to the pressure, and the patient usually complains of a dull headache. One of the first symptoms that causes the patient to seek one's aid, is the profuse discharge from the nose. He has to use the handkerchief very often. The discharge has an offensive odor, and is more profuse in the morning.

On **examination**, pus may be found flowing over the middle turbinate bone, and, after being wiped away, will be found flowing again by having the patient bend the head downward and forward. If the nasal opening is closed, all the symptoms of abscess in a marked degree will be observed.

Examine the teeth: they may be tender to the touch; or a little pus may be noticed, oozing down by the side of one or more of the teeth. All these symptoms point to antral disease, and it will be necessary for you to **confirm the diagnosis** by one of the following means: (Fig. 60).

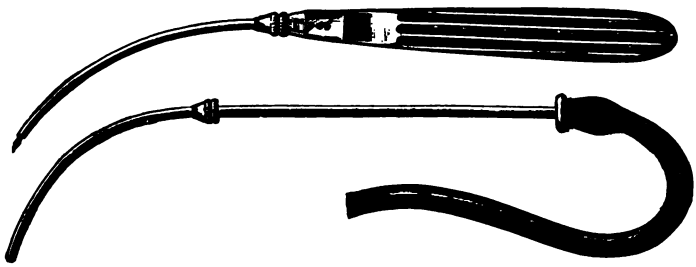
FIG. 60.

Lamp to illuminate the antrum.

1. Method of Transilluminatian. Place the patient in a dark room, or cover the head with a dark cloth. Place the lamp in the mouth, and have the lips closed. If the antrum and lining membrane are healthy, both antra will be equally

illuminated; but, usually, over the affected side, the light will not shine through, and an opaque or cloudy picture will be presented. While this is a fairly good means of diagnosis, it is not always to be relied upon. Any tumor, or natural

FIG. 61.



Myles antrum trochar and canula.

thickness of the mucous membrane or of the bone, might present the same opaque appearance.

2. Method of Aspiration. Another means of diagnosis is to make an opening in the cavity by passing an aspirating trocar through the canine fossa, or the inferior meatus of the nose. (Fig. 61 and 62).

FIG. 62.

Douglas antrum trochar.

The most convenient point for aspirating the antrum is in the inferior meatus. Thoroughly cocainize, and use either one of the foregoing trocars. Pass the point into the nostril under the lower turbinate bone, about halfway back; then, by

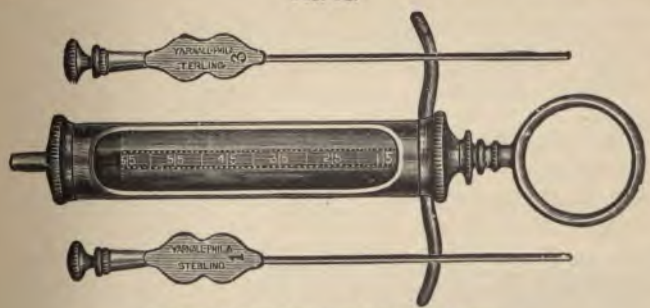
makingm pressu firre slightly upward and toward the outer side of the nose, the point will slip through the thin bone at this position, and enter the antrum. (Figs. 63 and 64).

FIG. 63.

Syringe for washing out the antrum.

Attach a syringe to the trocar, and force in warm antiseptic solution. The head is bent a little forward, and the fluid will thus flow out of the natural opening of the antrum, through the nose. By collecting it in a basin the nature of the lesion may be determined. If the fluid returns clean, it is certain

FIG. 64.



Syringe for washing out the frontal sinus.

that there is not much infection; but if there is a thick, muco-purulent discharge, which sinks to the bottom of the dish, it is just as certain that the diagnosis of empyema of the antrum is correct.

It must be remembered that, in some cases, the sinusitis is in the ethmoid cells, and that the pus, in flowing down, finds

its way into the antrum. It would be impossible in that case to cure the antrum without at the same time curing the ethmoiditis.

Treatment.—When it has been decided that there is pus in the antrum, operate in one of the following ways:

1. Extract either the first or second bicuspid tooth, selecting the one more sensitive when tapped by the handle of the mirror or applicator. The roots of these teeth often extend into the cavity. There is only a thin partition of bone separating them from the antrum. By using a dental drill, or an ordinary hand drill, the **antrum may easily be entered by following the cavity left by the tooth.** Make the opening as large as possible, and wash out the antrum. This may be done every day. At the same time, make an application of iodine, or carbolic acid solution, to the lining membrane or, with a small syringe, put in about a drachm of the following mixture:

℞.
Iodoform . . . . . gr. x.
Albolene . . . . . ʒ i.
Mix, and make a suspension.
S.—Shake before using. For external use in office.

If it is necessary to keep the cavity open for any length of time, one may use the Myles' antrum tubes or, better still, have a dentist make a gold or platinum tube which will fill the opening and which may be fastened by a clamp to one of the remaining teeth. Such a tube may be left in for any length of time. The antrum may be washed through the tube, and the patient may do it at home every day, and occasionally the tube may be taken out and cleansed.

The only **advantage of this method** is that the opening is at the bottom of the cavity and the drainage is perfect.

One of the **objections** is that food may get into the tube; but the chief objection is that one cannot properly explore the antrum, nor curette the cavity to get rid of the granations; tissue which is almost certain to be there. It is sometimes

necessary to destroy a tooth to enter the cavity, and this is a valid objection.

The other method, which might be called a **radical operation,** is the one that is giving the best results at present. It has the advantage of not destroying any teeth. It is not necessary to have a drill to perform the operation. The opening can easily be made large enough thoroughly to explore it, and

Fig. 65.

Retractor for the cheek while operating on the antrum.

to curette it in order to remove any granulations. The point selected for the opening is through the alvealor margin, just above the teeth, in the canine fossa, or over the first bicuspid. Inject a solution of equal parts of one per cent cocaine into the tissues at the point to be opened. This will help to control the bleeding, which is usually very free for a short time. The patient should be completely subject to ether, and the mouth should be held open with a retractor (Fig. 65) on the side to be operated on, the first incision being made through the mucous membrane about half an inch above the teeth, and ex-

Fig. 66.

Elevator

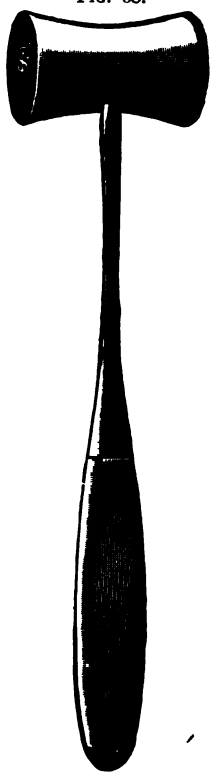
tending from the second molar tooth forward to the frenum. With an elevator (Fig. 66) loosen the periosteum both upward and downward, so as thoroughly to expose the bone at the point one wishes to open. The bleeding which occurs at this time may be controlled by iodoform compress. The

bone is not thick at this point, and the opening may easily be made with a mallet and small chisel (Figs. 67 and 68), and may then be enlarged with a pair of bone-forceps (Fig. 69).

FIG. 67.

Chisel.

FIG. 68.



Mallet.

This opening is made large enough to permit the finger to enter, care being taken that the lower margin of the opening is on a level with the floor of the antrum, and in this way securing perfect drainage. Now take a rather large curette (Fig. 70), thoroughly clean out the entire antrum cavity, and examine with the finger to see that no granular tissue remains. After the curetting the wound bleeds very freely, but it can be controlled by using peroxide of hydrogen, following it with a wash of some antiseptic solution and a packing of iodoform gauze. This will be removed in twenty-four hours, the cavity washed out, and the packing again put in the antrum. The iodoform packing is kept in as long as there are any signs of pus. The original opening is left to close by granulation, and the patient is instructed how to wash the cavity with a small syringe at home every day. The cavity is kept healthy and clean and soon heals, the results being very satisfactory.

As an adjunct to the operation, it is often well to enlarge the natural opening

into the antrum, which is done by first cutting away the anterior end of the middle turbinate bone. If this is done before the opening into the antrum is made, it will be necessary to plug the nostril to control the bleeding which takes place. For this reason, some operators leave the nasal part until the antrum operation is completed.

FIG. 69.

Bone-forceps.

It has been suggested by some to make the nasal opening large enough to allow washing and packing the antrum, so that the opening through the alveolar process will close quickly; but, so far, the best results are obtained by treating the antrum through the original opening, and allowing it gradually to close by granulation.

FRONTAL SINUSITIS.

Inflammation of the frontal sinus frequently occurs as a complication of cold in the head, the inflammation extending from the nasal cavity; and, whenever the middle turbinate bone becomes diseased, the same condition will often spread to the frontal, and ethmoidal cells.

The symptoms are usually well marked but often highly variable, including pain in the infraorbital region, neuralgic in character and generally constant in pressure. The pain is increased by blowing the nose or stooping over. There may

be some swelling and puffiness over the eye. The patient complains of a discharge from one nostril and of the frequent use of the handkerchief.

On **examination**, pus or mucopurulent secretion is found flowing over the anterior end of the middle turbinate bone. It is rather tenacious when it is wiped away, and more will appear by having the patient bend the head well down. The middle turbinate bone is usually swollen, soft, spongy, and pressing against the septum.

FIG. 70

Curette for Antrum work

Diagnosis.—With the foregoing symptoms, diagnosis is confirmed by the use of the frontal lamp. This is the same as the antrum lamp, only covered by a hood, except the end that is placed under the supraorbital arch. Double lamps may be had, which help to compare both the frontal sinuses at the same time. The use of the lamp, though helpful, is not always to be relied upon, and is of very little use in some cases for the following reasons: One or both sinuses may be absent, or very small, and in this case there would be an opaque picture on each side. One may be large and the other small, and one will illuminate less than the other. Some of them contain pus and a very thick lining of mucous membrane, and consequently will not illuminate properly.

Treatment.—The treatment may be described under two heads—one being the intranasal and the other the extranasal opening of the frontal sinus. In either case it is absolutely necessary to have free drainage.

In doing the **intranasal operation**, first cut away part of the middle turbinate bone, then with a small bent curette or small cutting-forceps it may be possible to enter the frontal sinus and clean it out. Use a long pointed syringe (see Fig. 64) and wash out the cavity with antiseptic solution and dry by means of cotton

on applicators. Then carry a narrow strip of iodoform gauze and lightly pack the cavity. This is left in for twenty-four to forty-eight hours, then removed and carefully washed every day with mild antiseptic solution. If the frontal sinus may be reached in this way the operation is always very successful, but the difficulty of getting into the sinus by this method is a great objection to the operation, especially so in long-standing cases where it is imperative to thoroughly curette the sinus and remove all granulations; but it should always be tried first in the hope of avoiding the open operation which is more serious and may result in a scar on the forehead.

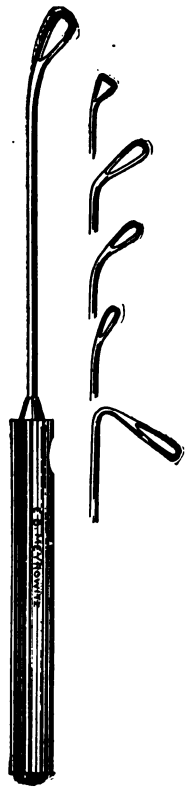
Extranasal Opening of the Frontal Sinus.—The eyebrow is shaved and the surface thoroughly cleansed. Make an incision along the eyebrow beginning at the inner third or infraorbital notch and extending to the median line of the nose. Push back the periosteum so as to expose the bone; now with a small chisel or drill make an opening through the bone into the frontal cells. Enlarge the opening by cutting upward and inward in the inner half of the first incision. By using the bone-forceps the opening may be made as large as needed to thoroughly explore and curette the sinus. After all the necrosed tissue is removed, take a small curette or director and enlarge the natural opening for drainage into the nose. Through this opening a small drainage-tube may be placed extending into the nose. The external opening may now be closed and the cavity washed every day through the drainage-tube. As soon as the inflammation subsides, which will usually be in four or five days, the tube should be removed by pulling down with a small pair of forceps and the cavity left to close up.

The results of this operation in suitable cases are usually very good. Some operators prefer to treat the cavity as an open wound. Carry a small piece of iodoform gauze as a drainage tube into the nose and pack the cavity with iodoform gauze and allow it to heal by granulation. The only objection to this method is that there may be a slight scar where the opening into the bone was first made.

ETHMOIDITIS.

Definition.—Ethmoiditis is an inflammation of the mucous membrane within the ethmoid cells and over the ethmoid bone. The ethmoid cells are separated by a very thin plate of bone both from the orbit and brain, consequently any operative work in this region must be done very carefully to avoid injury or perforation of these thin walls.

Fig. 71.



A useful curette for frontal or ethmoidal cells.

The inflammation of the ethmoid cells may be **acute** or **chronic in form**, the former usually terminating in the latter, as there is very little tendency to spontaneous recovery. In many cases of atrophic rhinitis and ozena, the ethmoid cells are more or less affected. There is a very close relation between sinus disease and nasal polypi.

Symptoms.—Deep-seated pain over the lower frontal region or sometimes the bridge of the nose. Thick yellow pus which flows over the posterior ends of inferior turbinate bone and occasionally we find in this pus small pieces of bone—or crepitation may be felt over the bone or with the probe. If there is any necrosis there will be the peculiar odor to the pus. There may be considerable exopthalmus due to pressure, and even in rare cases we may get an emphysema of the eyelid due to the disease of the ethmoid or to injury while operating.

On examination, one finds the middle turbinate bone swollen, red, congested, almost in a polypoid condition, with a foul yellowish discharge flowing over it. By using a fine bent probe one may succeed in getting into the ethmoid cells and detect dead bone. (Fig. 71.)

Treatment.—The treatment of ethmoiditis is to establish free drainage and to keep the parts thoroughly clean. This is done by cutting away the anterior part of the middle turbinate bone, and, with a small curette or cutting forceps, enter the ethmoid cells and remove all necrosed tissue. Wash out the cells using a small bent syringe, using one of the antiseptics already mentioned. This may be done twice each day and followed with an oily spray.

℞.
Camphor . . . . . gr. v.
Iodoform . . . . . gr. x.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Use in oil atomizer.

After thoroughly cleansing, inject about a half-drachm of the following solution into the cavity with a fine pointed curved syringe:

℞.
Iodoform . . . . . ʒ ss.
Liquid albolene . . . . . ʒ i.
Mix, and make a solution.
S.—Use as directed.

When the intranasal method of operating does not give relief then the **external operation** is necessary. The incision is made along the inner angle of the orbit about the same as that used in opening the frontal sinus. The frontal sinus is opened and through its floor the ethmoid cells are reached. All the cells are thoroughly curetted and a large opening made into the nose for drainage. The external wound is closed after the cavity is thoroughly sterilized. The wound heals without much disfigurement. Always be careful, in irrigating through the nose, not to disturb the wound.

QUESTIONS.

What is ozema? How would you treat a case of it?
What is vasomotor rhinitis? Give the other common names of this condition.

Give the symptoms of vasomotor rhinitis. What is the ætiology? Describe fully the treatment.

What are nasal polypi?

How would you diagnose them?

Where are they usually found?

How would you diagnose polypi from a malignant growth of the nose?

How would you treat nasal polypi?

What instruments would you use?

What is an exostosis? Ecchondrosis? Describe the operation for removal and the instruments necessary?

What is the aftertreatment when exostosis has been removed?

If the postoperative bleeding were severe what would you do?

What is hypertrophic rhinitis? How would you differentially diagnose the true from the temporary form?

Give the pathology of hypertrophic rhinitis.

What is the result of the disease if not corrected?

How would you treat a case of hypertrophic rhinitis?

What are the symptoms of enlargement of the posterior ends of the turbinate bones?

How would you treat them and why?

How would you diagnose and treat an enlarged middle turbinate bone?

What is atrophic rhinitis?

Describe the clinical conditions of the nasal cavities in atrophic rhinitis.

What is the cause of atrophic rhinitis?

Give the pathology of atrophic rhinitis.

What is the prognosis and why?

Describe fully the treatment of atrophic rhinitis.

How do you examine the posterior nares? What do you see in it?

What difficulties do you sometimes meet in the examination?

What is rhinitis and how many forms may it take?

Give the etiology and diagnosis of acute rhinitis?

Give the subjective and objective symptoms of acute rhinitis.

How would you differentially diagnose acute rhinitis from foreign body of or tumor in the nose?

Describe fully the treatment of acute rhinitis.

What is chronic rhinitis and what is the cause of it?

What are the subjective and objective symptoms and how would you treat them?

When would you use a douche-cup for the nose? What are the dangers of using one, and how would you avoid them?

Describe the symptoms and appearance of the nose when a foreign body is in the nares.

Describe fully how you would treat a foreign body in the nares.

What is rhinolith? How would you treat a rhinolith?

What is an abscess of the septum?

How would you treat a case of abscess of the septum?

Describe the antrum.

How would you diagnose a case of suppuration in the antrum?
What is the usual cause of inflammation of the antrum?
Describe the operation for opening the antrum and how you would treat the cavity afterward.
What do you mean by inflammation of the frontal sinus?
Give the symptoms of frontal inflammation.
What are adenoids? Give the other names for them.
How would you diagnose a case of adenoids?
Describe fully the symptoms in a case of adenoids.
Why should adenoids be removed?
What instruments are necessary to remove adenoids?
How would you operate without the use of anæsthesia?
What general anæsthetic would you prefer and why?
Why should a general anæsthetic be used to remove adenoids?
Describe fully the operation for removal of adenoids when an anæsthetic is used.
What malignant tumors are sometimes found in the nose?
How would you diagnose malignant disease of the nose?
How would you treat a case of frontal inflammation?
What is ethmoiditis and how would you treat it?

CHAPTER III.

DISEASES OF THE PHARYNX.

Examination and General Principles.—For examination of the pharynx, the patient sits in the same position as for examination of the nose.

Look first at the **general condition of the mouth**, tongue, teeth, noting thz mucous membrane whether it is red or congested or if any sores be present. Now examine the **pharynx** holding the tongue down with a tongue-depressor. *In using a depressor do not use much or any force but have the patient breathe as quietly as possible.* Many patients will try to help and the more effort they make the harder it will be to examine. One will occasionally find a patient in whom it will be impossible to make a satisfactory examination on account of the way he rolls the tongue or the very rigid condition of the

muscles, and also in some very nervous patients who are over-anxious to help you by opening the mouth too much and keeping the muscles all tense. When this occurs the author often advises them to use a spoon at home several times a day standing before a mirror and trying to see his own throat. In this manner the tongue becomes accustomed to the depressor and when the patient returns for examination in a few days the results are much more satisfactory. When the tongue is held down properly and the patient breathes easily, examine the condition of the pharynx. First look at each **faucial tonsil** to see whether enlarged, red, swollen or filled with leptothrix. Notice the condition of the **pillars of the fauces**, especially the anterior, whether it is adherent to the tonsil or spreading out over it almost hiding it from view. At the same time look at the **uvula**, then at the **pharyngeal wall** itself, noting the condition of the mucous membrane, whether hypertrophied or atrophied, the condition of the follicles and whether the membrane is free from secretions or not. It is always well to inspect **behind the palate** and it will sometimes be necessary to use a palate hook to obtain a full view.

CLASSIFICATION OF DISEASES OF THE PHARYNX.

Acute pharyngitis.
Chronic pharyngitis.
Follicular pharyngitis.
Syphilitic pharyngitis.
Tuberculous pharyngitis.
Retropharyngeal abscess.
Paralysis of the pharyngeal muscles.
Foreign bodies in the pharynx.

ACUTE PHARYNGITIS.

Synonyms.—Simple pharyngitis; inflammatory sore throat; catarrhal sore throat.

Etiology.—Exposure to cold and wet is probably the most frequent cause, for it is seen more frequently in the damp months of the year. Traumatism sometimes causes it, such as swallowing a bone, hot tea or coffee; the irritating fumes of smoke, iodine, ipecac or, in fact, any of the irritating fumes one might be exposed to. The other factors which might be spoken of as indirect causes are the rheumatic and gouty diathesis, gastric and intestinal disorders, intemperance in the use of alcohol and tobacco; inability to breathe through the nose. Unhealthy sanitary surroundings is one of the most potent causes of many of the troubles found in the upper respiratory tract. We also find the pharynx affected by the toxins of measles, scarlet fever, typhoid fever.

Symptoms.—Slight chill, rise of temperature to 101° or 102° F. Aches and pains in the limbs. A burning feeling in the throat and pain and stiffness in swallowing. The throat feels raw and dry and soon becomes covered with a tenacious secretion.

On **examination** one finds the mucous membrane red, congested, swollen, especially along the sides and over the anterior pillars of the fauces. The tonsils are not swollen. There are no white patches or ulcerations to be seen. The signs are usually confined to the mucous membrane of the pharynx, although it may extend upward to the postnasal space and downward to the larynx.

Treatment.—Treatment of acute pharyngitis varies in different cases, depending on the cause. If seen early, give the patient a hot, mustard foot-bath, a Dover's powder with a good hot drink and wrap up warmly in bed. This will usually start free perspiration and relieve the congestion. Give a saline cathartic.

Cold compresses to the outside of the neck, and change often during the first few hours. Control the temperature, pain, and nervous irritation with salol and phenacetine in appropriate doses every two hours. Great benefit is obtained by giving small doses of bromide of soda every two or three

hours. When the mouth is very dry and parched, sucking ice is very grateful to the patient.

If there should be a rheumatic or gouty diathesis, then suitable remedies for these troubles are indicated. After the acute stage is passed some astringent application should be made to the pharynx.

A solution of nitrate of silver, sixty grains to the ounce, applied carefully to the pharynx and repeated in six or eight hours, has a very beneficial effect and will often cut short the attack. **The patient at home may use** antiseptic gargles, glycothymolin borolyptol, thymoformal, putting one teaspoonful into a quarter-glassful of water; usually hot water is more soothing and beneficial than cold. The author invariably uses water as hot as the patient can safely bear. After each gargle which should be at least every hour, have him spray the throat with—

℞.
Menthol . . . . . gr. v.
Chloroform . . . . . ♏ v.
Eucalyptol . . . . . gr. v.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Use in an oil atomizer and spray throat after each gargle.

There are many lozenges which are beneficial in these cases. Wyeth mentholated tablets, to dissolve one in the mouth occasionally, are very pleasant, also troches containing rhatany.

If there is any history of rheumatism, apply to the throat with an applicator, tincture of guiac every two hours and give the patient half a drachm of the ammoniated tincture of guiac in a glass of hot milk every three hours.

The following is a mild astringent and gives good results in some cases—

℞.
Pulveris aluminis
Pulveris boraci
Pulveris potassium chlorate . . . . .āā ʒ ss.
Mix, and make a powder.
S.—ʒ i. in a half glassful of hot water to gargle every hour.

Also,—

℞.
Potassium chlorate powder . . . . . ℥ ss.
Potassium nitrate . . . . . ℥ i.
Mix, and make a powder.
S.—In half a glass of hot water to gargle every two hours.

If the disorder is due to any intestinal disturbance, this must all be attended to before any good results may be hoped for.

CHRONIC PHARYNGITIS.

Definition and Synonyms.—Chronic pharyngitis is a chronic inflammation of the mucous membrane of the pharynx, very frequently a later stage of acute pharyngitis, and sometimes called clergymen's or singers' sore throat.

Etiology.—In very many of the cases, chronic pharyngitis is secondary to other disease, such as nasal obstruction or lesions in the frontal and ethmoid cells. Before any benefit is to be expected these conditions must be corrected. Frequent attacks of acute pharyngitis, with obstruction of nasal respiration, is a frequent cause. The overuse of tobacco and alcohol, irregularities of the digestive tract, and constitutional diathesis, especially rheumatism, turberculosis and syphilis are also factors.

The **symptoms** vary much according to the cause. The mucous membrane is usually red and congested in spots and, between these red areas, the mucous membrane is pale and slimy and very frequently is covered with a tenacious, stringy secretion. The voice is changed, sometimes hoarse and tiring easily. There may be a slight hacking cough with a desire to clear the throat and sometimes there is pain on swallowing.

On **inspection** we sometimes find considerable thickened tissue along the sides of the pharynx, back of the posterior pillar. This might be called **lateral pharyngitis.** And it is important to remember it for in many cases one will find all of

the pharynx in a fairly healthy condition but with these thickened ridges along the sides giving the patient all the symptoms of chronic pharyngitis. These lateral ridges are usually looked upon as indication of some obstruction in the postnasal space.

Treatment of chronic pharyngitis is one of the most trying diseases to treat and requires a great deal of time and patience. First one must consider the general condition of the patient, the occupation and sanitary condition of the place of abode, also the nose, tonsils, digestion, which must all be as normal as possible or appropriate remedies used for derangements of any of these parts. The mucous membrane must be thoroughly cleansed of adherent secretions. This may be done by any alkaline spray or by rubbing the parts with a cotton applicator moistened with any antiseptic solution. The congested spots may be corrected by two or three applications of nitrate of silver solution, twenty or thirty grains to the ounce. If the lateral pharyngitis is marked it may be necessary to make some stronger application or even to make one or two light punctures with the electric cautery. Very frequently it will be necessary to make some astringent applications to the post-nasal space. Such as sulphocarbolate of zinc, ten grains to the ounce or alumnol, twenty grains to the ounce. These applications should be made every four or five days with cotton on an applicator, the tip of which should be bent at right angles. At home the patient should gargle or spray the throat twice daily with antiseptic solution such as borolyptol, glycothymolin or alkaline thymoformal, using one teaspoonful in a quarter-glassful of water and following this with an oil spray.

℞.

Eucalyptol	♏ v.
Benzoinol	ʒ i.
Liquid albolene	℥ i.

Mix, and make a solution.

S.—Spray into the throat after the gargle.

Many patients complain of tickling cough and of the amount of mucus in their throat in the morning, what they often call the dropping of mucus into the throat. This is all due to the thick mucus which collects in the postnasal space during the sleeping hours and drops down the sides of the pharynx. Some hot gargle, such as normal saline solution, bicarbonate of soda, one teaspoonful in a pint of water, used first thing in the morning is very beneficial in loosening this thick mucus and the patient is able to clear the throat without much effort of coughing. If they have been using the voice too much or in a bad way, absolute rest for a short time is required. Rheumatic diathesis requires antirheumatic remidies. The amount of tobacco and alcohol should be lessened.

In some cases of chronic pharyngitis, good results follow the use of the benzoinal inhaler—by inhaling two or three times each day for about five minutes at a time some stimulating inhalant.

℞.
Tincture benzoin . . . . . ℥ ii.
S.—℥ i. on hot water in the inhaler.

℞.
Menthol . . . . . gr. x.
Oil tar . . . . . ℥ i.
Alcohol to . . . . . ℥ i.
Mix, and make a solution.
S.—℥ i. on hot water to inhale as directed.

ATROPHIC PHARYNGITIS.

Synonyms.—Pharyngitis sicca; dry pharyngitis; dry catarrh of the pharynx.

Definition.—Atrophic pharyngitis is an atrophic or dry condition of the mucous membrane and the submucous tissue of the pharynx.

Etiology.—Atrophic pharyngitis is usually the result of inflammatory process due to irritants, or indirectly caused by nasal obstruction, as it is frequently seen in cases of atrophic

rhinitis and may be due to the irritating discharge from the nose. It is often a sequel of hypertrophic pharyngitis. Breathing and sleeping with the mouth open causes a dryness of the mucous membrane of the pharynx. Anything which interferes with the circulation of blood in the pharynx causes poor nutrition and a consequent dry condition of the mucous membrane.

Symptoms.—Characteristic burning, itching sensation, and an extremely dry feeling in the throat are the chief symptoms.

There is usually a dry hacking cough, very little expectoration except what accumulates in the postnasal space and is removed by hawking it up. The secretions of the glands are changed in quality; they become thick and tend to stick to the pharynx, forming dry crusts and scabs which are very hard to remove. Sometimes the membrane looks dry, parched and glazed, with here and there a nodular condition due to the fact that some of the glandular tissue is not so atrophied as elsewhere. If the secretions are examined, a great variety of bacteria may be found.

Treatment.—Remove any constitutional causes as quickly as possible. Get the general health into good condition, and keep the parts thoroughly clean with a gargle or spray. If there are any congested spots, correct these by making two or three applications of nitrate of silver. Massage the parts with a fifty per cent. solution of borolyptol, glycothymolin every other day in the office.

After the pharynx has been thoroughly cleansed with antiseptic spray, the following makes an active stimulating application—

℞.
Ichthyol
Lanoline . . . . . āā ʒ ss.
Mix, and make an ointment.
S.—Rub over the pharynx with a cotton applicator.

A five to ten per cent. solution of ichthyol in keralene is also a very good stimulating application.

Ichthargan, five to twenty per cent. solution in liquid albolene, acts very well in many cases. These applications should be made every day in the office until the mucous membrane is in a healthy condition.

Have the patient use at home some antiseptic gargle, such as Seiler's tablets or Dobell's solution, three times each day, and follow it with some oil spray.

℞.
Chloroform
Eucalyptol . . . . . āā ♏ v.
Liquid albolene . . . . . ℥ i.
Mix, and make a solution.
S.—Use in an oil spray after gargle.

Give cathartics if necessary. Alkaline cathartics seem to act the best in these cases.

Phosphate of soda (ʒ—ii.) every morning in a glass of hot water is very efficient. Small doses of potassium of iodide, one to two grains given three times each day, has a very beneficial effect upon the glandular condition, and, when combined with arsenic, stimulates the secretions and puts the membrane into a more moist condition.

Careful attention should be paid to the digestive tract and to the hygienic surroundings.

FOLLICULAR PHARYNGITIS.

Definition.—Follicular pharyngitis is a form of chronic pharyngitis diagnosed by the pharynx being dotted with enlarged follicles which look bright and red, while the surrounding tissue is often pale and atrophic in appearance with stringy mucus adherent in places. Follicular pharyngitis usually occurs in campaign speakers, preachers and singers.

Etiology and Symptoms.—The etiology and symptoms are very like those in simple chronic pharyngitis and in general, very closely similar.

Treatment.—First try to correct the cause. If due to irritating fumes, or dust, avoid these as much as possible. When caused by excessive speaking or singing, complete rest is indicated. If the follicles are large they may be destroyed or shrunk in one of the following ways—

The membrane is thoroughly washed or cleansed with an alkaline spray. Apply nitrate of silver solution to each follicle, being careful not to touch any other part of the pharynx.

Chromic acid may be fused on the point of an applicator and carefully applied to the center of a few of the largest follicles. This may have to be repeated to the other follicles a few days later.

A fine cautery point heated to a dull red may be applied to the center of some of the follicles. It is not well to do many at each sitting as it might leave the throat too painful for a few hours.

Still another method of treating these enlarged follicles is by the use of a small curette or bistoury, doing two or three every few days until all are better.

Cleanse the parts every day with an antiseptic spray or massage the pharynx with a fifty per cent solution of borolyptol or glycothymolin. The following is often useful in some of these cases:—

℞.
Potassium iodide . . . . . ʒ i.
Tincture iodine . . . . . ♏ xv.
Glycerine . . . . . ʒ ii.
Mix, and make a solution.
S.—Apply with an applicator every other day.

Another very serviceable stimulant application or spray is:

℞.
Zinc sulphate . . . . . gr. x.
Antipyrine . . . . . gr. vi.
Hamamelis water . . . . . ʒ i.
Mix, and make a solution.
S.—Apply with an applicator or spray the throat once daily.

The **general treatment** is much the same as for other forms of chronic pharyngitis, but often good results are obtained by putting the patient on antirheumatic remedies, especially the drinking of plenty of alkaline water. If the cough which sometimes accompanies this should be troublesome, it may be necessary to give some sedative to control it for a short time. Small doses of codeine or heroin answer very well or the sucking of some throat pastile may give the necessary relief.

TUBERCULOUS PHARYNGITIS.

Tuberculous pharyngitis **occurs** comparatively rarely, seldom as a primary lesion but nearly always secondary to pulmonary or laryngeal tuberculosis.

Symptoms.—In the early stages, the symptoms are much the same as in subacute pharyngitis. As the lesions advance, inflammatory infiltration causes local swelling, which in time breaks down, forming shallow, grayish ulcers. These ulcers have the characteristic "nibbled edge" appearance—usually there is some enlargement of the cervical glands. Pain is more or less severe, deglutition difficult, and as the ulceration spreads, all the symptoms increase and the usual systemic signs of tuberculosis appear. There is a peculiar odor and a slimy, tenacious secretion which causes a difficulty of clearing the throat.

Differential Diagnosis.—The only disease tuberculosis might be mistaken for is syphilis of the pharynx. The followng is Bosworth's classification for differentiation:—

Syphilitic Ulcers.	*Tuberculous Ulcers.*
Deeply excavated.	No apparent excavation.
Few granulations, and those highly inflammatory.	Much indolent granulation.
Deep-red areola.	Faint areola.
Sharply-cut edges.	Irregular and ill-defined edges.
Distinct demarcation.	Demarcation indistinct.
Yellow purulent secretion.	Grayish, ropy mucus secretion.
Discharge profuse.	Discharge scanty.
Penetrating to deeper tissues.	Superficial, with lateral in place of deep extension.
No fever as a rule.	Hectic fever as a rule.

Prognosis.—The prognosis is usually grave because the lesion here is nearly always secondary to severe pulmonary disease, and also, on account of the pain and difficulty of eating, the patient's general health decreases very quickly.

Treatment.—It is very necessary that the pharynx be kept clean and free from the tenacious secretions that are apt to collect. Warm saline gargles or sprays are the best. If the ulcers are large and ragged, gently curette, then apply—

℞.
Iodol . . . . . ʒ i.
Ether . . . . . ℥ i.
Mix, and make a solution.
S.—Apply every other day with a cotton applicator.

Follow this by a soothing oil spray—

℞.
Cocaine . . . . . gr. v.
Menthol . . . . . gr. x.
Liquid albolene . . . . . ℥ i.
Mix, and make a solution.
S.—Spray the throat after gargle

Some observers like a menthol and orthoform emulsion applied to the ulcer every other day. Lactic acid 25 per cent to 50 per cent. solutions applied. The cough and pain must be controlled with small doses of heroine or codeine. Special attention should be given to the general nutrition of the patient with good suitable food, fresh air, tonics of cod-liver oil, creasote, iron and stimulants of some kind. If practicable the patient should be sent to Arizona or New Mexico to live an outdoor life until he is well.

SYPHILITIC PHARYNGITIS.

Syphilitic pharyngitis occurs often but usually in the secondary or tertiary form. The primary lesion or hard chancre has been observed several times on the tonsil due to direct inoculation, kissing, using the same dishes, unclean sur-

gical instruments and *coitus ab ore*. The first thing noticed is a sore throat, pain or swelling, the tonsil may be enlarged and red and there is a small ulcer which does not yield to ordinary treatment. It has a grayish color, some induration, and the cervical glands may be somewhat enlarged. While there may be every evidence of the primary sore, it is always safer to wait for the secondary rash which is sure to appear in from four to eight weeks. The tertiary lesions are the ones which most usually come under our notice and they appear at any time from eight months to two years.

Diagnosis.—The diagnosis is made from the general history, symptoms, and appearance. In the early stage mucus patches may not give rise to much pain except when eating hot or spicy foods. It looks like a small erosion of the mucous membrane, pale in color, very little induration except in a long-standing lesion or where two or three of them coalesce. Some of these patches are very slow in healing and may have considerable induration, but as a rule they are superficial.

In the **tertiary form** we usually get a history of an initial lesion. There may be a gumma involving the tonsil or soft palate which gradually becomes infiltrated, breaks down in the form of ulceration which, on healing, leaves a cicatrix and deformity. This process has an unmistakable odor. The pain depends on the size and location of the ulcer. This ulcer has the distinct induration, ragged edges, and sloughed-out appearance.

The glandular enlargement at the angle of the jaw and neck is very pathognomonic but, if in doubt, the quick response to antisyphilic remedies confirms the opinion. It is often remarkable how quickly the disease responds to medicine in these lesions of the upper respiratory tract.

Treatment.—A mucus patch in the throat requires particular care on account of its contagiousness and the tendency it has to spread and ulcerate. Do not allow any tobacco, alcohol or highly spiced foods, in fact, anything that would in any degree irritate the throat. Start constitutional treatment at once.

In **the primary** and **secondary stages,** mercury in some form must be given. Hydrargyrum cum creta, in one-grain tablets, starting with one, and increasing to tolerance, three times each day and increasing up to ten or twelve, is very serviceable.

In the tertiary form, iodide of potassium is indicated, starting with ten to twenty drops of the saturated solution in plenty of water, two hours after eating, three times each day, and ascending one drop each day till the point of tolerance is reached. In many cases this should be aided by some form of mercury, either by inunction or by the protoid pill of mercury, gr. one-sixth, one, three times each day, with plenty of water, two hours after eating.

When there is much ulceration the necrotic tissue or slough may be gently scraped away with a small curette and application of nitrate of silver (ten per cent solution) made every three or four days, then the part should be kept covered as well as possible with an antiseptic powder—compound stearate of zinc and iodoform. **At home the patient** must keep the parts as clean as possible by employing gargles or sprays—

℞.
Hydrogen peroxide
Borolyptol . . . . . āā ʒ iv.
S.—ʒ ii. in a half glass of water. Gargle every hour or two.

Then follow this with a soothing oil spray or lozenge. The diet should be nourishing and the patient should live out of doors if possible.

The **prognosis** depends more on the general condition of the patient, and the results are usually good, except when the patient is in a run-down condition or when the constitutional treatment has been delayed too long, then the ulcerations get very large and deep and may have considerable necrosis, which often leads to great deformity. Even after some cases of recovery, the cicatricial tissue which has formed often causes a great deal of trouble and pain. Cases have been re-

ported when the soft palate becomes adherent to the pharyngeal wall and causes a great deal of defect both in speaking and breathing. When this adhesion is liberated there is a great tendency to reunite and it is often quite difficult to prevent it. A piece of gauze, passed through the nose and allowed to hang below the palate, will sometimes prevent adhesion, or some other device of a similar nature may be employed.

RETROPHARYNGEAL ABSCESS.

Definition.—Retropharyngeal abscess is an abscess of the cellular tissue behind the posterior wall of the pharynx due to the breaking down and suppuration of the lymphatic glands in that region.

It **occurs** most frequently in children but is also found in adults. The usual position is behind the soft palate, almost on a level with the Eustachean tubes on either side of the median line. The pus may burrow and extend downward—the children are frequently of a strumous diathesis and the suppuration is often of a slow character. It may be due to traumatism and occasionally is a sequal of scarlet fever, and diphtheria.

Symptoms.—In children the symptoms may be indefinite, especially when slow of progress. The general health becomes impaired, food is refused. The pain on swallowing increases, and the voice has a peculiar throaty quality. Ordinarily the symptoms are those of an acute sore throat—fever, chills, headache, deep-seated pain which gradually increases and is augmented by movements of the head. There is a feeling of foreign body in the throat, obstruction to nasal respiration and a constant desire to clear the throat.

On examining the pharynx, one may see a bulging tumor, usually on one side, the mucous membrane over it being tense, and on palpating with the finger, we may be able to detect fluctuation. If the tumor is large, the swelling may extend toward the angle of the jaw.

The **prognosis** is usually good except in some young children whose general condition is not good or when the pus involves the vertebræ and occasionally in a large abscess that opens spontaneously, and the child, being in a weak condition, may be strangled by the amount of pus. Œdema of the glottis is a complication that may occur and is especially serious in weak children.

The **treatment** will depend on the condition of the abscess at the time of examination. If seen early before the accumulation of much pus, a free puncture through the mucous membrane may act as a means of clearing it away. When once the abscess is formed, it must be treated the same as an abscess anywhere else.

Apply ten per cent. cocaine over the surface of the abscess which may be opened with a small knife or trochar. In using the knife, make a small incision in the median line as low down as possible, in the most prominent point of the swelling. As soon as it is opened, bend the head forward at once to prevent the pus flowing into the larynx.

In a nervous, frightened child it may be necessary to give a little anæsthetic to open the abscess and in that case Rose's posture is the safest, in which the head is extended over the edge of the table and lowered. Wash the cavity with antiseptic solution, using a small syringe. It is usually not necessary to put in drainage—the mouth should be kept cleansed frequently with some gargle and a fluid diet kept up for a few days, as well as tonics and every means necessary to build up the general health.

The other method of treatment is the external operation and is indicated when the swelling is laterally situated end involves the glands at the angle of the jaw. It is necessary in this operation to give an anæsthetic. After palpating and locating the most prominent point of the swelling, an incision, is made along the anterior border of the sternocleidomastoid muscle, cutting in very carefully and making the incision parallel with the large vessels of the neck. When the pus

cavity is reached, it is washed out and then lightly packed with iodoform gauze for twenty-eight to forty-four hours.

In cases in which the situation of the pus is doubtful, the Hilton-Rose method of gently burrowing into the forno with a blunt instrument after the skin has been incised, is advisable.

The general condition of the patient must be carefully attended to—cod-liver oil, hydrophosphites, syrup of the iodide of iron, plenty of fresh air and sunshine.

FOREIGN BODIES IN THE PHARYNX.

Foreign bodies are occasionally found in the pharynx—fish-bones, pins, tooth-picks, bristles of tooth-brush. They are usually imbedded, and are found in the tonsil, behind the tonsil, or at the base of the tongue on either side of the epiglottis.

Symptoms.—The symptoms will depend on the size, nature and location of the foreign body. Sharp articles like pins or fish-bones will cause pain on speaking or swallowing, may cause œdema, inflammation and ulceration. If the object should be large it might cause choking or suffocation, but that would be rare. Nervous patients will have all these symptoms even after the article has been either swallowed or ejected and one should be guided accordingly when such patients come for treatment. The irritation caused by the foreign body may sometimes remain for some time after the removal, giving all the symptoms of being still present.

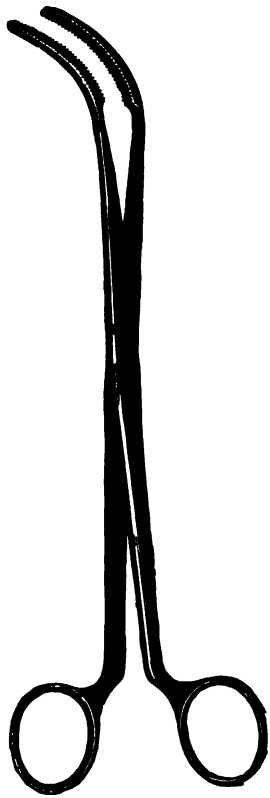
Treatment.—The treatment in any case is removal of the article.

In examining the patient, look carefully at the region of both tonsils and at the base of the tongue. When the object has once been seen it is usually easily removed by forceps. If in the tonsil, ordinary nasal forceps will be available and if further down, the curved forceps will be preferable for seizing it. (Fig. 72).

As soon as located, spray the throat with a solution of cocaine and remove the object. If nothing is discovered and the patient still insists that there is a foreign body present, examine very carefully again, spray with a mild solution of cocaine, give three or four doses of bromide of soda, fifteen grains (depending on age of the patient) three hours apart, and have him use a mild alkaline spray three times a day at home for a few days.

In ordinary cases explain to the patient that after the removal they may have the same sensation for a few hours, owing to the irritation caused by the foreign body.

Fig. 72.



Forceps for removing foreign bodies from the pharynx.

TUMORS OF THE PHARYNX.

Tumors of the pharynx **might be divided into two classes**—benign and malignant. All these tumors, whether benign or malignant, are usually confined to the tonsil or lateral walls of the pharynx.

The **benign tumors** may be classified as papilloma, fibroma, angelioma and lipoma, while the **malignant tumors** are sarcoma or carcinoma.

Occurrence.—Fibromata are usually seen in the tonsil as a small, pedunculated tumor. **Papillomata** are more frequent and often involve the uvula and soft palate. Sometimes a **calcareous deposit** is found in the tonsil. They begin in the crypts of the tonsil, increase in size, and at times become very large. They should be removed and the cavity thoroughly curetted.

The **malignant tumors** (comprising sarcoma or carcinoma) may occur as primary sores in the tonsils but frequently as secondary deposits of a tumor in another part of the body.

Sarcoma occurs at any age, while the carcinoma is usually found after middle life. Carcinoma is usually warty and irregular in appearance, and after it begins to ulcerate there is a thin, very offensive secretion. It resembles syphilis in many details. In syphilis the pain is more marked during the act of swallowing, while in malignant disease it is acute all the time, and of peculiar lancinating character, sometimes radiating towards the ear. In syphilis we often get the superficial ulceration and mucus patches, or the characteristic deep ulceration.

In syphilis all the lymphatic glands of the body are more or less effected, while in malignant disease only the surrounding glands are enlarged and they are also painful. One should always be careful of the diagnosis in those cases of one tonsil being enlarged, hard and indurated, and when in doubt, always try the effect of antisyphilitic remedies freely used for a short time.

The **treatment** of malignant disease of the pharynx is always a very difficult undertaking. On account of the intimate relation with the cervical glands, the tendency to recur is always very marked. Injection of toxins and electrolysis offers little hope of success but the surgical operation for the removal of these tumors must always be undertaken with caution. Carcinoma, if operated on early, gives a better chance for success than sarcoma. In many of the cases all that may be done is to use remedies that will lessen the pain and make existcnee a little more comfortable.

NEUROSES OF THE PHARYNX.

Anæsthesia of the pharynx means the insensibility of the pharynx to feeling or irritation, and may be a sequel of diphtheria, syphilis, and certain drugs.

Hyperæsthesia of the pharynx is an increased sensitiveness of the mucous membrane of the pharynx, caused by acute inflammation, elongated uvula, or by the excessive use of tobacco, alcohol, and certain drugs. It is often a serious obstacle to the examination of the larynx and may be overcome by the aid of cocaine or bicarbonate of soda.

Paræsthesia of the pharynx is an abnormal sensation, as burning or itching, and is usually a reflex symptom of other conditions, such as enlarged tonsils, varicose veins at the base of the tongue, or aneurism.

Paralysis of the muscles of the pharynx is rather a rare disease and is usually a sequel of diphtheria, syphilis, or cerebral affection. If the soft palate be involved, food is often forced into the nose during the act of swallowing, and, if the glottis be affected, food may find its way into the larynx and trachea.

Treatment.—The treatment will depend much on the cause. Strychnia in increasing doses is indicated, also iron, arsenic, massage of the parts. Electricity is especially good in these cases—the faradic current, using the negative on the back of the neck, and the positive on each side in front, or the static current, using a small glass electrode on the pharynx, making the current comfortably strong for five to ten minutes every day.

QUESTIONS.

Describe the pharynx.
What instruments are necessary in the examination of the pharynx?
Describe the method of examining the pharynx.
Name the ordinary diseases to which the pharynx is subject.
Give the etiology and symptoms of acute pharyngitis.
What might acute pharyngitis be mistaken for?
Outline fully the treatment for acute pharyngitis.
What is chronic pharyngitis?
By what other names is it sometimes called?
What is follicular pharyngitis and why is it called by this term?
What is the etiology of chronic pharyngitis?
Describe fully the symptoms both of simple chronic pharyngitis and follicular pharyngitis.

How would you diagnose these forms of pharyngitis from other inflammatory conditions of the pharynx?

Describe fully the treatment of follicular pharyngitis.

What is atrophic pharyngitis?

How would you diagnose atrophic from chronic pharyngitis?

What are the etiology and symptomatology of atrophic pharyngitis?

How would you treat acute cases of atrophic pharyngitis, and why?

Describe the condition found in tuberculous pharyngitis, and give the symptoms.

What other conditions might be taken for and how would you distinguish them?

Describe fully the treatment of tuberculous pharyngitis.

What forms of syphilis are usually seen in the pharynx?

Describe the appearance and differential diagnosis of syphilitic ulceration of the pharynx.

Outline a method of treating these ulcerations.

What do you mean by neurosis of the pharynx? Define anæsthesia, paræsthesia, hyperæsthesia.

What is a retropharyngeal abscess?

What is the diagnosis of a foreign body in the pharynx, and, how would you treat it?

CHAPTER IV.

DISEASES OF THE FAUCIAL TONSIL.

Anatomy.—The faucial tonsils are two in number, situated on either side of the mouth between the anterior and posterior pillars of the pharynx. They are glandular in structure, composed of nodules held together by lymphoid tissue, and covered with epithelium which dips into the tissue, leaving here and there small openings called crypts which number from eight to fifteen in each tonsil.

Each tonsil is freely supplied with bloodvessels—branches from the dorsal artery of the tongue and also from the inferior and superior palatine arteries.

The size of the tonsils varies in different people. They are usually larger in children (as all the lymph glands are) and

tend to atrophy in adult age, and in some old persons are completely obliterated.

The physiologic function of the tonsils is still in much doubt. The normal tonsil is not visible to ordinary inspection. As an organ of voice, it is of no particular consequence. Three-fourths of all the cervical adenitis in children is due to the absorption of some irritant through the tonsil. Some say the tonsils secrete certain liquids which act as a lubricant and in this way aid digestion.

Dr. Labbe thinks the tonsils take due active part in the formation of blood.

Dr. Masini believes that the tonsils have an internal secretion.

It is now clearly proved that they are lymphatic glands, that they absorb certain bacteria and that acute articular rheumatism is often due to absorption through the tonsil.

The following are **reasons why enlarged tonsils are unhealthful:**

They interfere with proper breathing.

The patient is much more subject to catching cold and the general health is more or less impaired.

There are certain nervous reflexes which are traceable to the irritation caused by enlarged tonsils.

The mortality in diphtheria is much greater in children who have enlarged tonsils.

Enlarged tonsils always tend to cause more or less catarrh of the upper respiratory tract.

Nearly all large tonsils tend to atrophy as the patient reaches the age of eighteen or twenty but the constitution is exposed to so many dangers during that time that it is not wise to wait.

The surgical method of treating them is so well understood that the danger of removal is much less than those to which the patients might be exposed by allowing the tonsils to remain.

ACUTE TONSILLITIS.

Acute tonsillitis **consists in** an acute inflammation of the mucous membrane covering the tonsil and also of the tonsillar tissue.

Acute tonsillitis **may be excited by** exposure to cold and wet, to irritation of vapors, steam, sewer gas. Rheumatic and tuberculous diathesis predispose to it. In a few cases it may be due to some form of infection. Tonsillitis is looked upon by some as an infectious disease, but there is still a certain amount of doubt. We often see one tonsil inflamed and sore and in the course of a few days the inflammation has spread to the other tonsil. There is no doubt that the same cause which gives it to one child may give it to several, if they should be exposed to it.

Symptoms.—The patient has high fever, chills, headache, pain at the angle of the jaw, inability to open the mouth wide, and great difficulty in swallowing. There is pain on pressure.

On examination, one finds the tongue heavily coated, the tonsils red, swollen and congested. The anterior pillars are usually swollen and sometimes the uvula also. If the crypts are infected, one may see a collection of secretion which may form into a membrane, yellowish-white, somewhat resembling the exudate of diphtheria. The voice is thick and muffled, due to the relaxed condition of the vocal cords. There is always inflammation in the nasopharynx which causes more or less middle ear symptoms. The inflammation at the early stages is of superficial character but later on it usually extends to the deeper structure of the tonsil.

Treatment.—*If the patient is seen early,* the attack may be aborted by giving a hot foot-bath, Dover's powder, and putting him to bed in the hope of starting free perspiration. A saline cathartic should be given and cold compresses or ice applied to the outside of the throat. If there should be very high temperature, drop-doses of the tincture of aconite, given every hour, is beneficial. Quinine is also given for the fever,

but it is objectionable on account of the effect on the ears. Salicylate of soda, in appropriate doses, given every two hours, has a good effect, especially if there be any evidence of rheumatic diathesis.

The sixth of a grain of morphia may be given and repeated as required, and two drops of tincture veratrum viridis, given in a teaspoonful of water every hour for six or eight doses, will often act remarkably well in some acute cases. The following gargles are efficient:

℞.
Sodium bicarbonate
Sodium biborate
Sodium salicylate . . . . . āā ʒ i.
Mix, and make a powder.
S.—ʒ i. in a half-glassful of hot water. Gargle every hour.

The following formula is also advised:

℞.
Tannic acid . . . . . āā ʒ i.
Gallic acid . . . . . ʒ ii.
Glycerine
Mix, and make a solution.
S.—ʒ i. in a half-glassful of hot water. Gargle every hour.

If the attack is advanced when first seen, apply a little cocaine over each tonsil and with a small, sharp bistoury make two or three punctures into the tonsillar tissue to relieve the congestion and then have the patient use a hot gargle every half hour, such as—

℞.
Codeia . . . . . gr. 1½.
Soda salicylate . . . . . gr. x 100.
Mix, and make a powder and divide into ten capsules.
S.—One capsule every two hours.

If the pain and swelling continue, one often brings great relief by using hot vapor inhalations—

℞.
Menthol . . . . . gr. x.
Benzoinol . . . . . ʒ ii.
Oil of pine . . . . . ʒ i.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—One teaspoonful on boiling water. Inhale the steam every two hours.

℞.
Oil of tar . . . . . ʒ ii.
Alcohol . . . . . ʒ i.
Mix, and make a solution.
S.—ʒ i. on boiling water. Inhale steam every two hours.

Dr. H. J. Lipes says many cases of acute tonsillitis may be aborted by injecting into the gland a few minims of a one to four per cent. solution of carbolic acid.

In some cases good results follow the application to each tonsil of guiacol or protargol ten per cent. and the use of—

℞.
Liquor of ferric chloride . . . . . ʒ i.
Glycerine . . . . . ʒ i.
Mix, and make a solution.
S.—ʒ i. in a half-glassful of water. Gargle every hour.

℞.
Soda benzoate . . . . . gr. x.

Or,—

℞.
Sodii salicylate . . . . . gr. x.
S.—One every three hours with a glass of lithia water.

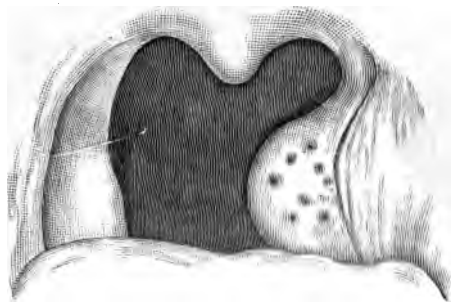
℞.
Ammoniated tincture of guaiac.
S.—ʒ i. in a glassful of hot milk every three or four hours.

Guaiac in the form of lozenges, or chlorate of potash tablets, to dissolve in the mouth, have a certain beneficial effect.

Peroxide of hydrogen used on a cotton swab or in an atomizer and then washed off with alkaline solution, is spoken of highly by some.

The use of strong nitrate of silver over the tonsil does not seem to act well, besides being unpleasant to the patient. It seems to sear the follicles and seal up the secretions, which will result in the tonsil swelling more and in some cases an abscess forming.

FIG. 74.



Acute tonsillitis on the left side.

HYPERTROPHIED TONSILS.

Hypertrophied or enlarged tonsils might be divided into **two classes**: the soft, boggy tonsil, which is the more frequent and seen in children, and the hard, firm, fibrous tonsil of adults.

The tonsillar hypertrophies of children are the more frequently seen. They are usually soft and spongy, very frequently associated with enlargement of the glandular tissue in the postnasal space and also at the base of the tongue. When they are all enlarged it is called the ring of Waldeyer or the lymphoid ring.

In the hard tonsil, the glandular tissue is enlarged and hardened by the increased amount of connective tissue which is due to repeated attacks of acute inflammation.

The amount of enlargement varies in different cases. In some, there may be very little swelling and yet cause many symptoms. The crypts may be filled, or there may be marked

adhesion with the surrounding parts, especially with the anterior pillar. These anterior pillars in some cases are so adherent and spread over so much that they almost completely hide the tonsil from view.

In other cases we may find very large tonsils which apparently never cause any disturbance, and in some other cases we find one tonsil normal and the other one very much enlarged.

The **symptoms** caused by enlarged tonsils as a rule are never very prominent. There is very little pain except during an acute inflammation. There may be difficulty in swallowing

FIG. 74.

McKenzie's tonsillotome: made n three sizes.

and sometimes the food regurgitates through the nose. There may be earache due to indirect pressure on the ear. Usually difficulty in breathing is present.

There are often reflex nervous conditions due to enlarged tonsils. Some will object to cutting them out, saying that they will grow again or that one is interfering with nature; others that the removal has an injurious effect on the voice There are some cases on record where there is a recurrence after the tonsil has been removed, but these cases are by no means frequent. The effect on the voice is usually one of improvement. There is no doubt but that these enlarged growths and all the abnormal conditions surrounding them have a more or less injurious effect on the voice. There are a few cases, in nervous, hysterical people, where the voice has been badly affected for a time, but the great majority of cases are improved in every way by correcting any abnormal condition of the tonsils.

FIG. 75.

Mathieu's tonsillotome; made in three sizes.

Treatment of Enlarged Tonsils in Children.—It is always best to reduce them by cutting them out, and it may be done by using either a Mackenzie's or a Mathieu's tonsillotome. (Figs. 74 and 75.)

There are some improvements on the Mathieu's which are very good. In the new instruments the forks are not barbed; and, again, it is made with a fewer number of pieces, making it more easily cleansed. Both these tonsillotomes are made in three sizes to fit all cases, and when one is doing exclusive nose and throat work it is well to have all three; but for ordinary practitioners the medium size will answer all purposes.

Enlarged to[illegible]l be removed as soon as they begin

to give any trouble. They occur much sooner in some children than in others, but as soon as they are noticed and are believed to be interfering in any way with the general health of the child, they should be removed. It is not wise to operate on an acutely inflamed tonsil, one is apt to have more hemorrhage at that time and also more pain, but we should not hesitate even then, if there is any danger of asphyxiation from the great amount of swelling in the tonsils.

The question of an anæsthetic will have to be regulated by each case. They can usually be seen better and removed more easily when the child sits or is held in an upright position and in a good light. The operation is a shock to the average child, especially when they see the bleeding, and it will require considerable persuasion to have the second one taken out. For that reason it is preferable to give an anæsthetic in the majority of cases. One can take more time, remove them more carefully and the child is less frightened, which is of considerable importance, especially if the operator happens to be the family physician.

In removing tonsils from children, apply a little cocaine over the tonsil, and see that the anterior pillar is not adherent to the

FIG. 76.

A curved knife used in separating the anterior pillar when adherent to the tonsil.

tonsil; if so, it must first be loosened and pushed back. Have the child in the same position as for removing adenoids, put the tonsillotome in flat until it reaches the tonsil, then turn and place it over the tonsil, at the same time using the finger as a guide to fit it over the growth. The instrument is now over the tonsil; it must be held parallel with the anterior and posterior pillars and, before cutting, it may be necessary to make pressure on the outside of the tonsil in order to steady it and make the cutting more easy, but as a rule the child gags a good deal as soon as the instrument is in position and this

act will force the tonsil into the instrument without any pressure being required on the outside. Wait a few minutes and remove the other in the same manner. Bleeding is usually slight and stops in a short time. If the hemorrhage is severe, control it by one of the following methods:

Fig. 77.

Ricord's harmostate, to control bleeding from tonsils.

1. By sucking pieces of ice and by placing a cold compress on the outside of the neck.

2. By applying adrenalin on a cotton applicator to the bleeding surface.

3. By employing the following styptic:

℞.

Tannic acid	gr. xx.
Gallic acid	gr. xxx.
Glycerine	℥ i.

Mix, and make a solution.
S.—Apply to the bleeding surface.

4. By pressing a cotton pad over the tonsil with the finger of one hand, making firm counter pressure on the outside of the neck.

5. Pressure may be made with a pair of long forceps or a special clamp, as shown in Fig. 77.

6. By tying a purse of string suture around the stump.

When an anæsthetic is given, exactly the same care is required, only the patient is lying on the table, and, the light not being so good, one will have to depend more to guiding the tonsillotome with the index finger. In this case the [illegible]es not gag, and it will often be neces-

sary to make firm, steady pressure on the outside in order to secure a good hold of the tonsil.

Treatment of Enlarged Tonsils in Adults.—The tonsils of adults are usually found in one of two pathologic conditions—the hard, firm, dense tonsil, having a much increased connective tissue, and the other a soft, boggy tonsil.

In some cases one will find chronic follicular tonsillitis in which the crypts are filled with a cheesy secretion called leptothrix. In many cases the anterior pillar covers, and is firmly adherent to, the tonsil, so that on examination very little of the tonsil may be seen on account of it being so tied down to all the surrounding tissue. These patients complain of the usual symptoms of enlarged tonsils but very often their chief trouble is the repeated attacks of quinsy to which they are exposed—and very often the first time the enlarged tonsils are brought to the notice of the surgeon is during some attack of acute tonsillitis or a peritonsillar abscess (quinsy). In these cases wait until the acute attack has subsided, then remove or

FIG. 78.

Knight's electric tonsil-snare.

destroy the tonsils in some way, either by the use of the tonsillotome, the electric tonsil-snare, cold wire-snare, or the electric cautery. (Figs. 78, 79, 80 and 81).

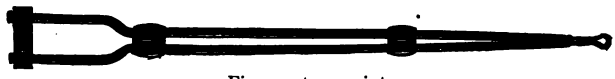
In all adults, in using the tonsillotome, the dangers of hemorrhage must be taken into account. Several cases are on record of alarming hemorrhages occurring from two hours to three or four days after the operation.

In using the tonsillotome in adults, it is safer to use them only on those large, soft tonsils and then not cutting too deeply nor with too sharp an instrument. Crushing it slowly off is best. In some cases where it may be necessary to use the

tonsillotome, it is well before doing so to make a few punctures with the galvano-cautery into the tissue of the tonsil, in this way one may destroy the bloodvessels and remove danger of bleeding.

Some prefer the cold wire-snare for these cases. It is a slow method and requires a very strong instrument.

FIG. 79.



Fine cautery point.

The hot wire-snare may be used in the same way. It has the advantage of doing the work quicker with a very slight amount of danger of bleeding. They both have the disadvantage of being difficult to properly fit over the tonsil. The author prefers to use the ordinary cautery point, burning a deep groove down the centre of the tonsil, beginning at the top and extending to the lowest part. It requires a strong heat, for the moisture of the tonsil quickly cools the small cautery point.

FIG. 80.

Cautery handle.

One tonsil may be destroyed at a sitting. The reaction as a rule is not p[illegible] three or four days make an application of silver nitr[illegible]uterized surface, and in the meantime

the patient should use some antiseptic gargle frequently for a few days.

The other tonsil may be destroyed, if necessary, in a week.

In some cases of sunken or submerged tonsils, when the tonsil is large but has a flat appearance on account of being so adherent to the surrounding tissue, one may get good results by using the tonsil-punch to nip or cut away small pieces of the tonsil and in this way gradually remove the greater part of it.

FIG. 81.

Hartman's tonsil-punch.

In all these operations the operator must be careful not to wound the anterior pillars if possible, as they are very apt to bleed freely as well as become painful. When the anterior pillars are very large the author sometimes reduces the size of them with the electric cautery, burning them from behind so that in swallowing the food does not pass over a wounded surface.

LEPTOTHRIX TONSILS.

Tonsils, whether enlarged or not, but that they have the crypts filled with leptothrix or a cheesy deposit of any kind, are often very troublesome to heal. They are a constant source of irritation—and are nearly always in a state of

subacute or chronic inflammation. They interfere with the general health, causing foul breath. The only treatment that answers well for this form is to destroy each crypt with the electric cautery, placing the cautery point down to the bottom of each crypt and turning on the current. This completely sears over and destroys the tonsil. The application of iodine, silver and carbolic acid has very little influence on this condition of the tonsil and will not cure it.

ENLARGED TONSILS WITH ATROPHIC PHARYNGITIS.

There is one form of enlarged tonsil in which it is questionable if the removal is indicated; that is, where one finds a dry atrophic condition of the pharynx and a moderately enlarged tonsil. In these cases it acts more or less as an irritant and has a tendency to stimulate the secretions and in this way help to moisten the pharynx. And if removed or destroyed the pharynx may become even more dry.

The after-treatment in all forms of enlarged tonsil is simply to use some astringent gargle daily—and for the first few days it is better not to drink anything very hot and eat only soft food.

PERITONSILLAR ABSCESS.

Synonyms.—Acute phlegmonous tonsillitis; circumtonsillar abscess; quinsy; quinsy sorethroat.

Definition.—Quinsy is an acute inflammation resulting in the formation of pus in the tissues surrounding the fauceal tonsils, sometimes involving the gland tissue itself but frequently confined only to the surrounding tissue.

Abscess of the tonsil is rather rare but sometimes, when there is considerable pus, it breaks through and involves the tonsil.

The direct cause of the suppuration is due to infection of some form either from within or without the body. Exposure to cold is an exciting cause by bringing on an acute attack of

tonsillitis which ends in a peritonsillar abscess. Chronically enlarged and diseased, tonsils are great predisposing causes and are noticed in nearly every case of repeated attacks of quinsy. Bosworth and Lenox Browne are firm believers in its rheumatic origin and it is very often noticed that the quinsy abscess is associated with an acute attack of rheumatism.

Symptoms.—The patient is usually seen the second or third day of an attack. There is great pain and difficulty of opening the mouth, the voice is thick and husky, tongue heavily coated and usually there is profuse flow of saliva. The temperature is not very high. The patient may complain of pain in the ear. As the formation of pus increases, all these symptoms become more prominent.

On examination, one finds the tonsil about normal in size, in the very early stages, but it does not occupy its normal position. It may be pushed inward almost to the uvula; on the outerside or back of the tonsil there is a swelling, the anterior pillar is tense and bulging and all around the tonsil, the tissues seem to be misplaced. It might be mistaken for diphtheria, malignant disease or syphilis, but a careful study should exclude these. In malignant disease there is usually considerable ulceration which is not observed in quinsy.

In syphilis the symptoms are seldom acute and there are usually other symptoms of syphilis. The greatest difficulty would be in diphtheria.

There are no enlarged glands, no albumin in the urine and, if still in doubt, make a microscopic examination. When the abscess has formed it may take several directions and if left to itself will rupture in one of the following ways:

The most usual course is forward through the anterior pillar of the fauces. It may extend backward and open through the posterior pillar, or forward below the tonsil.

Treatment.—In the very early stages, one may be able to abort an attack of quinsy in the same manner as an attack of acute simple tonsillitis. One of the best applications for this purpose is:

℞.
Sodium bicarb
Sodium biborate
Sodium salicylate . . . . . āā ʒ i.
Mix, and make a powder.
S.—One teaspoonful in a glass of hot water, and gargle every hour, using the whole glassful each time.

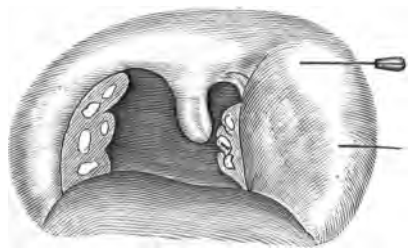
And at the same time give sodium salicylate in ten-grain doses every two hours until the physiological effects are noticed.

Several cases are on record in which thyroid extract, given in five-grain doses every four hours for twenty-four hours at the beginning of an acute case, aborted the attack.

These methods may sometimes cut short an attack, but as a rule the patients present themselves too late for any shortening of the process.

When the diagnosis is undecided as to whether pus is already formed, always make an exploratory incision. First use a five or ten per cent. solution of cocaine freely over the tonsil—then with a small knife make an incision. Remember that the abscess is not in the tonsil, consequently do not make the incision through the tonsil but through the anterior pillar into the tissue on the outside of the tonsil.

FIG. 82.



Peritonsilar abscess, showing the proper location for making the opening incision.

The ordinary guide for opening quinsy abscess is the centre of a line drawn from the base of the uvula to the last

lower molar tooth—at the same time to open it as near the most bulging point as possible.

FIG. 83.

A pair of small pointed forceps, useful to enlarge the incision in peritonsilar abscess.

If one is not sure that pus has already forme, make a small opening, then with a probe make further examination all

around the tonsil and one is almost certain to find pus. In fact there is seldom or never a quinsy without pus, because the name itself indicates the formation of abscess, and although it is often difficult to exactly locate the pus, it is almost certain to be there. When once it is found, the original opening may be made larger by stretching it with a pair of scissors or forceps—and if necessary, the knife may be used to make it larger, cutting in the direction of the original guide line and extending it if necessary almost to the base of the uvula. The pus flows out very freely and it is seldom necessary to curette the cavity but it may be cleansed with peroxide of hydrogen, using a small pointed syringe.

It is always well to make a free opening, otherwise the incision will close and pus reform and it will have to be opened again. The patient is instructed to use hot gargles such as borolyptol or boroformalin, five or six times daily, for three or four days. After the evacuation of pus the swelling goes down quickly and the patient feels perfectly well in a very few days.

Treatment After Recovery.—It is always well after an attack of quinsy to treat the tonsils by reducing them in size by cutting them out, or burning them with the electric cautery, breaking up any adhesions between the pillar and the tonsil and getting the throat generally into a better condition. In this way one is almost certain to prevent future attacks.

QUESTIONS.

What are the faucial tonsils?
What are their physiological functions?
Why are enlarged tonsils unhealthful?
Classify enlarged or diseased tonsils.
What is acute tonsillitis? and give the cause and symptoms.
How would you diagnose a case of acute tonsillitis?
How would you treat a case of acute tonsillitis?
What is follicular tonsillitis?
How would you treat enlarged tonsils in children? and give your reasons.
What form of enlarged tonsils are usually seen in adults?
How would you treat enlarged tonsils in adults?

What effect on the general condition and especially the voice, has the removal of enlarged tonsils?

What would be the results if they were not removed?

Explain fully what you would do in a case of bleeding from the tonsils after operation.

What is quinsy or peritonsillar abscess?

Describe the symptoms and the appearance of the throat in quinsy.

How would you diagnose quinsy from acute tonsillitis?

Describe fully the treatment and the subsequent treatment of peritonsillar abscess.

CHAPTER V.

DISEASES OF THE UVULA.

Classification.—Elongated uvula, bifid uvula, acute inflammation of the uvula, œdema of the uvula, acute inflammation and œdema of the uvula.

ACUTE INFLAMMATION OF THE UVULA.

Acute inflammation and œdema of the uvula may be classed and described as one disease-process.

Symptoms.—The uvula is red, congested, swollen and, on examination, it is almost club-shaped, apparently filled with fluid. The pharynx is usually inflamed and the patient complains of a feeling of irritation, coughing, and a desire to swallow and clear the throat.

Treatment.—If there is not much œdema, make a thorough application of nitrate of silver on the uvula and repeat it next day. If the œdema is extreme, take a small bistoury or needle or sharp scissors and make two or three punctures into the uvula at the most dependant part. This will let the serum out, and then make an application of silver nitrate, repeat the silver application the next day and have the patient use an astringent at home every hour for twelve to twenty-four hours such as—

℞.
Alum pulvis
Borax pulvis
Potassium chlorate . . . . . āā ʒ ss.
Mix, and make a powder.
S.—ʒi in a half glassful of water to gargle every hour.

℞.
Acidi tannici . . . . . ʒ i.
Glycerine . . . . . ʒ i.
Mix, and make a solution.
S.—ʒi in a half glassful of water, to gargle every two hours.

Spray the throat with the following:

℞.
Alumnol . . . . . ʒ ii.
Borolyptol . . . . . ʒ ii.
Aqua . . . . . ʒ ii.
Mix, and make a solution.
S.—Use in atomizer every hour.

ELONGATED UVULA.

Symptoms.—The uvula is long, and lies on or hangs in contact with, the tongue, causing a constant desire to cough and clear the throat, more especially at night or when the patient lies down. Spasm of the glottis and attacks of asthma are sometimes caused by elongated uvula. It has an injurious effect on the voice and to public speakers and singers it is a source of great annoyance.

Treatment.—The treatment of elongated uvula is usually surgical. Astringent applications of silver nitrate, alum and such like fail to shrink it permanently and part of it must be cut off. This may be done in two ways:—

The **first method** is with curved scissors specially made for this purpose; or an ordinary pair of straight scissors might be used. (Fig. 85).

Apply a little cocaine to the surface, then, with a pair of forceps, seize the tip of the uvula and pull it gently forward.

While it is being held in this position the lower third or half is cut off with the scissors held in the other hand. In this way the part is removed and the cut surface faces backward so that the food in passing downward does not come into contact with the wounded surface. The bleeding seldom amounts to much. The wound after this operation is often quite painful, especially if the cut surface is not well placed. And it is well to tell the patient that for a few days the pain will be considerable.

FIG. 84.

Sajou's uvula scissors.

The **second method** used is to seize the uvula with forceps and with a sharp-pointed bistoury make an incision through and down to the lower extremity of the uvula;t then cut the other side in the same way. This leaves a reversed V-shaped opening.

The idea now is to bring the two cut edges together with a V-shaped fine needle and suture. Put in two or three sutures according to the size of the part removed. This operation gives good results in the large, thick uvula.

QUESTIONS.

What is the uvula? To what diseases is it subject?
How would you treat a case of acute inflammation of the uvula?
Describe the instruments and the method of treating elongated uvula.

CHAPTER VI.

DISEASES OF THE LARYNX.

Anatomy.—The larynx is composed of certain cartilages bound together by ligaments and forming a box-like cavity, sometimes called the voice-box.

FIG. 85.

FIG. 86.

Fig. 85—Hyoid bone and the laryngeal cartilages (Ellis).; G, body of the hyoid bone; H, large cornu; J, small cornu; A, epiglottis; B, thyroid cartilage; C, arytenoid era tilage; D, cricoid cartilage; lE, upper cornu, F, lower cornu of the thyroid cartilage.

Fig. 86—Vocal apparatus, on a vertical section of the larynx (Ellis).: A, ventricle of the larynx; B, vocal cord; C, ventricular band; D, sacculus laryngis; E, arytenoid cartilage; F, cricoid cartilage; G, thyroid cartilage; H, epiglottis; K, crico-thy- roid ligament; L, thyro-hyoid membrane.

There are nine cartilages in all, the largest being the thyroid, the cricoid or ring cartilage, and the epiglottis which is the lid of the valve which closes the glottis and prevents food from entering the larynx.

The other six cartilages are smaller and are arranged in pairs, the arytenoid, the cartilages of Santorini, and the carti-

FIG. 87. FIG. 88.

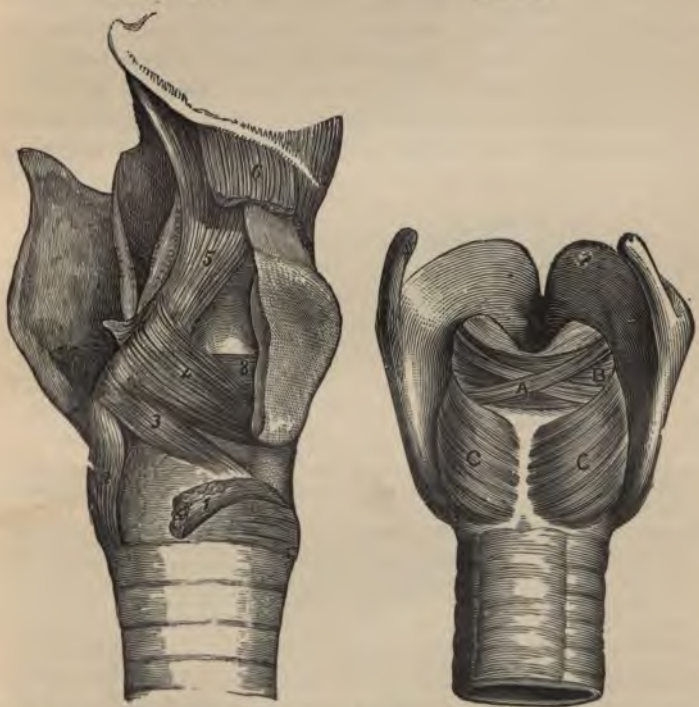


Fig. 87—View of the internal muscles of the larynx (Ellis). 1, Cricothyroideus detached; 2, cricoarytenoideus posticus; 3, cricoarytenoideus lateralis; 4, thyroarytenoideus, superficial part; 5, depressor of the epiglottis; 6, thyrohyoideus cut; 8, deeper part of thyroarytenoideus.

Fig. 88—Posterior view of the larnyx (Ellis). A, Superficial part of the arytenoideus muscle: B, deep part of the arytenoideus; C, cricoarytenoideus posticus.

lages of Wrisberg. The cricoid is the base or foundation of the larynx and is attached to the first ring of the trachea and articulates above with the thyroid. It is thicker posteriorly and has attached to it the cartilages of Santorini and Wrisberg. (Figs. 85 and 86).

The thyroid consists of two wings united in front at an angle forming the Adam's apple. Each wing is somewhat square in shape and extending from its posterior border are the superior and inferior cornua, one being attached to the hyoid bone and the other to the cricoid cartilage. (Figs. 87 and 88).

The cricoid and thyroid cartilages are united by the cricothyroid membrane and the thyroid is also connected to the hyoid bone by the thyrohyoid membrane. The epiglottis

FIG. 89.

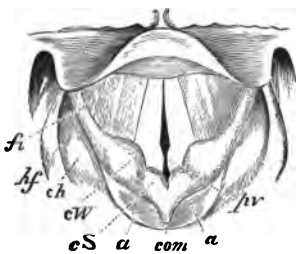


FIG. 90.

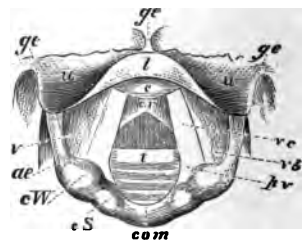


Fig. 89—Normal larynx during phonation. *V*, vocal cords; *cW*, cartilage of Wrisberg; *cS*, cartilage of Santorini; *fi*, false vocal cords, or ventricular bands; *ch*, pyreform sinus.

Fig. 90—Laryngoscopic diagram showing the vocal cords widely drawn apart, and the position of the various parts above and below the glottis during quiet breathing (Mackenzie). *ge*, Glossoepiglottic folds; *u*, upper surface of epiglottis; *l*, lip or arch of epiglottis; *c*, protuberance of epiglottis; *v*, ventricle of the larynx; *ae*, aryepiglottic fold; *cW*, cartilage of Wrisberg; *cS*, cartilage of Santorini, *com*, arytenoid commissure; *vc*, vocal cord; *vb*, ventricular band; *pv*, processus vocalis; *cr*, cricoid cartilage; *t*, rings of trachea.

varies much in shape and size, and is joined to the base of the tongue by three bands called the glossoepiglottidean folds.

The true vocal cords extend from the arytenoid cartilages to the angle of the thyroid cartilages and are formed by the lateral portions of the cricothyroid membrane.

The ventrical bands or false vocal cords are situated above

the true cords and are formed by the thyroarytenoid ligaments. (Figs. 89 and 90).

The ventricles of Morgagni are two pockets situated in the side walls of the larynx between the true and the false vocal cords. The **muscles** controlling the movement of the larynx are divided into two groups, extrinsic and intrinsic. The extrinsic are the sternthyroid, the thyrohyoid, the stylonopharyngeus, and the inferior constrictor of the pharynx.

The intrinsic are the cricothyroid, the posterior and lateral, cricoarytenoid and the thyroarytenoid.

The **nerve supply** of the larynx is from the superior and inferior laryngeal nerves. The superior has two branches, the external and internal, distributing both sensory and motor fibres to the external and internal parts of the larynx.

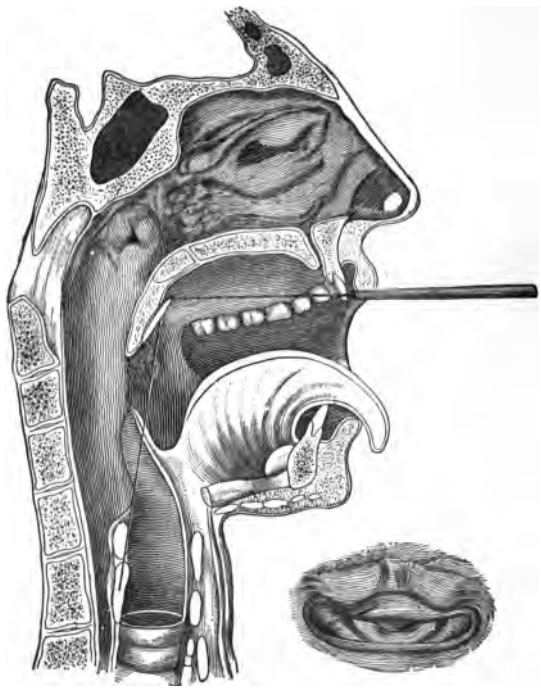
The inferior or recurrent laryngeal is the motor nerve of the larynx. The **blood supply** of the larynx is from the superior and inferior thyroid and some branches from the lingual. The cavity of the larynx is lined with mucous membrane—which contains a few elastic fibres and many glands which supply a certain amount of secretion for lubricating the vocal cords.

Methods of Examination of the Larynx.—Laryngoscopy is the act of examining the larynx, and the only additional instruments necessary are laryngeal mirrors. These vary in size and it is always well to use as large as will fit in the fauces nicely and at the same time give a complete view. In children, one would require a small one and in some adults with a small pharynx or with large tonsils it would also be necessary to use a small one.

The patient sits in the same position and light as for examining the nose or pharynx—he is told to open the mouth and breathe quietly. Place a napkin over the thumb and finger of the right hand, catch hold of the point of the tongue and make gentle traction. As a rule it is better for the examiner to hold the tongue himself as he can control the movements of the head better, but if necessary, the patient

can hold his own tongue with the thumb and index finger. Next select the proper size mirror, warm it gently by holding over gas jet or placing it in warm water. The introduction of the mirror is sometimes difficult, the patient may gag easily or he may be holding the mouth open in a very tense way, and it is sometimes wise to apply a little cocaine around the soft

FIG. 91.



Showing the laryngeal mirror in a faulty position in examination of the larynx.

palate and have him say A and take a long breath before using the mirror, for if he has gagged a few times before you get a view of the larynx, the effort he has made is sure to

cause some congestion of the larynx and change the color somewhat.

FIG. 92.

Showing the position of the tongue held out and the laryngeal mirror in examination of the vocal cords and larynx (front view).

If the tongue should roll up toward the roof of the mouth

as it sometimes will, it may be necessary to place a tongue-depressor on it.

Place the warm mirror against the uvula and as the patient says Ah, gently push it up and backward. He then takes an easy breath and repeats the Ah which will give you a view of the larynx closed and opened (Fig. 92).

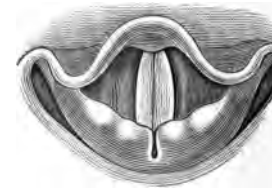
In examining the larynx, look first at the shape, size and color of the epiglottis which will appear as a reddish yellow arch in the upper part of the mirror. Always look for ulcerations or erosions.

Next in view are the arytenoid cartilages composed of the two nodules or cartilages of Wrisberg and Santorinini, between the two arytenoids is the interarytenoid space or commissure.

FIG. 93.

Showing the position of the cords in ordinary respiration.

FIG. 94



The position of the vocal cords during phonation.

FIG. 95.

The position of the vocal cords during deep breathing.

Examine these cartilages for enlargement, congestion, ulceration, or for thickening in the commissure. Notice if both arytenoids come together properly or whether one moves

more freely than the other. Now look beyond the cartilages and one comes to the vocal cord (Figs. 93, 94 and 95).

They are grayish white, sometimes almost pearyl white and Figs. 93, 94 and 95 show their normal position. Although there may be differences in the color, any variation of position or movement is abnormal and interferes with the proper functions of the parts.

Above the true cords are the false cords also called ventricular bands. They are of muscular tissue, red and sometimes so large and prominent as almost to cover and hide from view the line cords.

The space between the false and true cords is sometimes called the interventricular space. It is a small pouch or pocket into which foreign bodies sometimes find their way. In deep breathing, Fig. 95, the cords are far apart and by holding the mirror at different angles one may be able to see well down the larynx—even as far as the trachea and in some rare cases the bifurcation of the trachea may be seen.

Fig. 94 shows the larynx in the act of phonation, the cords are close together and tense, and the narrow space between them is called the glottis, rima glottidis or chink of the glottis.

Difficulties of Laryngoscopy.—The patient is very nervous, is straining and trying hard to help the doctor. In this way the muscles of the neck are rigid and it is extremely hard to get a view. Quiet and encourage the patient, tell him to breathe easily, to make no effort and have the muscles as relaxed as possible.

In other cases one will have a very unruly tongue that is difficult to keep down. Overcome this factor by using a tongue-depressor and making gentle pressure as the patient says A. Many of one's patients, when told to say A, will make a throaty sound like Ah. When they do, tell them to say E or A in a higher pitch, like singing, and after they have said it alternate this act with the taking of a long, gentle breath.

In patients who are suffering a great deal it is not well to make the examination too long, and, even in some nervous cases, where the examination has not been satisfactory, it is well not to continue too long the first time but do it in a very gentle manner. Encourage the patient by gentleness. On the following day one may be able to continue the examination in a much more satisfactory manner.

CLASSIFICATION OF THE DISEASES OF THE LARYNX.

The diseases commonly found in the larynx are:—

Acute laryngitis.
Chronic laryngitis.
Syphilitic laryngitis.
Tuberculous laryngitis.
Paralysis of the vocal cords.
New growths of the vocal cords.
Foreign bodies in the larynx.

ACUTE LARYNGITIS.

Synonyms.—Acute catarrh of the larynx; catarrhal laryngitis; false croup.

Definition.—Acute laryngitis is an acute inflammation of the mucous membrane. It is usually of superficial character but sometimes extends to the deep tissues and the muscles.

Acute laryngitis is usually caused by exposure to cold and wet, sudden changes from a warm, badly ventilated room to a cold, damp atmosphere, especially if the person is perspiring freely or is poorly clad. Long or excessive use of the voice, shouting in the open air or straining the parts by violent coughing. Intemperate use of alcohol and tobacco, unhealthful hygienic surroundings, living in badly ventilated rooms, and unhealthy conditions of the digestive organs indirectly cause the inflammation. Acute laryngitis is often a

complication of one of the acute fevers, measles, scarlet fever and smallpox.

Symptoms.—There is a feeling of dryness in the larynx, this is followed by a tickling sensation which causes a cough which only irritates the membrane. The cough is dry and hard and in children is often quite severe. As the disease progresses there is considerable pain and some fever. The voice becomes husky and of a deep quality—very feeble and sometimes there may be a complete loss of voice lasting for twenty-four to forty-eight hours.

Acute laryngitis in children often produces serious general disturbance, the tongue is heavily coated, pulse is full and bounding, and considerable difficulty in respiration. These symptoms are usually more marked at night and may be so severe as to waken the child with a sudden fright, almost strangulation. There may be some hemorrhage from the inflamed mucous membrane, several such cases have been reported as acute hemorrhage from the larynx.

On examination, the mucous membrane of the larynx is red, congested and considerably swollen in some places. The false vocal cords or ventricular bands are usually much swollen and during phonation may completely cover the true cords. There may be slight ulcerations in different parts of the mucous membrane. The epiglottis is usually inflamed and somewhat swollen.

Diagnosis.—The diagnosis is usually easily made in adults from the symptoms and general appearance but in young children, when it is difficult to get a view, it might be mistaken for diphtheria or true croup. When any doubt exists, a microscopical examination should be made. In diphtheria the false membrane may be usually seen in the pharynx and all the symptoms are more profound.

The **treatment** depends much on the condition of the patient and whether he is a child or adult. The ordinary simple laryngitis in adults is not serious and will often get well in a few days with little or no treatment. The serious-

ness always depends on the precise location of the inflammation and its tendency to œdema with consequent interference with respiration.

The disease is always more serious in children and requires prompt attention. If seen early it is always well to lessen the local congestion by giving an active cathartic; calomel followed by a saline, a hot mustard bath and a hot lemonade with Dover's powder to encourage diaphoresis. Keep the patient in a warm room and in bed if possible. No irritating food, no smoking, and as little use of the voice as possible. Cold compresses should be applied to the neck, changing them often, while the room is kept saturated with some steam medication, such as compound tincture of benzoin, oil of tar, or carbolic acid. Cold drinks, ice cream, cracked ice, are at times very grateful.

Strong applications of any kind to the larynx are not indicated, in fact do more harm than good. One or two doses of morphia combined with a little atrophia often lessen the pain and cut short the attacks. Potassium bromide in doses to suit the patient's condition acts splendidly.

Hot inhalations are very useful.

℞.

Menthol	gr. x.
Oil of pine	ʒ i.
Tincture of benzoin	ʒ i.
Liquid albolene	ʒ ii.

Mix, and make a solution.

S. — ʒ i. in boiling water. Inhale with a cone placed over the dish; or use in a benzoina inhaler five minutes every half-hour.

The same prescription may be used at home with a globe nebulizer every hour.

In some cases good results follow a spray into the larynx with a downward tip, first of a mild cocaine one or two per cent., then of an astringent like—

℞.
Alumnol . . . . . gr. x.
Aqua . . . . . ʒ i.
Mix, and make a solution.
S.—Use in atomizer two or three times a day.

Follow this in a few minutes by an oil spray. This may be done once or twice daily. Use also for ten or fifteen minutes each day an inhalation of one of the following:

℞.
Menthol . . . . . gr. vi.
Camphor . . . . . gr. v.
Oil of pine . . . . . ʒ i.
Liquid albolene up to . . . . . ʒ ii.
Mix, and make a solution.
S.—ʒ i. in Oi. of boiling water. Inhale steam.

℞.
Tincture of benzoin
Oil of tar . . . . . āā ʒ i.
Liquid albolene up to . . . . . ʒ i.
Mix, and make a solution.
S.—ʒ i. in O i. of boiling water. Inhale steam.

The cough should be controlled with small doses of codeine or heroine. If there is rheumatic tendency, salicylate of soda given every two hours until the physiologic action of the drug is apparent, then give smaller doses at longer intervals until complete recovery takes place. Five to ten grains of salicin, given every two hours, has often given prompt relief. The insufflation of powders into the larynx acts as an irritant and increases the cough. Gargling is of little use unless there is also pharyngitis. The gargle does not reach the mucous membrane of the larynx but indirectly it serves to clear away the mucus and in this manner has a good effect on the membrane below. When there is œdema, either of the glottis or larynx, prompt surgical treatment is necessary.

The œdema is due to watery infiltration of the tissues but not to vascular infiltration, one or two punctures or scarifications over the most swollen part will therefore often relieve

the swelling. After the scarifying, make a few astringent applications such as alumnol, nitrate of silver or liquor ferri. If the œdema does not then yield and the danger of suffocation is increasing, it may be necessary to perform tracheotomy. In some cases intubation may relieve but the swelling may be so great as to prevent the introduction of the tube.

CHRONIC LARYNGITIS.

Definition.—Chronic laryngitis is a chronic catarrhal inflammation of the mucous membrane of the larynx.

Etiology.—Chronic laryngitis is often a sequel of acute attacks. Using the voice in a faulty manner, especially in some singers and public speakers.

The abuse of alcohol and tobacco, exposure to irritating vapors or dust. Many of the cases are indirectly caused by some nasal obstruction which causes mouth-breathing and thus the air which passes through the larynx is often not of the proper temperature or moisture. It may also be a late stage of chronic pharyngitis, the inflammation extending to the larynx.

Certain constitutional conditions such as rheumatism, gout, and syphilis have more or less effect and must not be forgotten.

Any condition which might act as a constant irritant to the throat. Enlarged faucial tonsils and elongated uvula will often act as predisposing causes.

Symptoms.—The symptoms may be slight and variable according to the severity of the case. The voice is chronically hoarse and often it is completely gone for a time. This would be noticed more in singers or public speakers. There is a constant feeling of tightness about the throat, there may be some cough. The secretions are scanty, grayish white and often quite tenacious. This is more noticeable after a night's rest; the larynx seems to be filled with this tenacious secretion

which causes considerable cough and effort in the morning to get rid of it.

On **inspection** one finds the mucous membrane more or less congested with stringy, tenacious mucus attached to it in places. The vocal cords are more or less red, granular in appearance, and do not move as freely as they should. Sometimes the false cords are swollen so as to almost meet during phonation. One may find small ulcerations or erosions of the interarytenoid space or there may be considerable swelling of this space and in this manner prevent the proper action of the arytenoid cartilage and cause almost total loss of voice.

Diagnosis.—The diagnosis is as a rule not difficult and the chief thing that brings the patient for treatment is the huskiness of the voice or loss of the voice that has been bothering him for some time.

Simple chronic laryngitis should be differentially diagnosed from œdema of the larynx, tuberculous or specific ulcerations, paralysis of a vocal cord or some form of new growth. This is usually very simple from the general history of the case and the appearance with the laryngeal mirror. Each of these forms of disease will be described under its own heading and it will not be necessary to go minutely into the differential diagnosis.

The **prognosis** will always depend on the length of time the inflammation has lasted. The longer the time, the more slow the recovery will be, and in many cases it will be impossible to restore the voice to its original quality.

The **treatment** depends much on the cause. Correct any faulty method of singing or speaking, excessive smoking or dissipation of any kind. Remove the patient from irritating vapors or dust for a time. Bring the general health into as good condition as possible by favorable surroundings and tonics if necessary. Relieve any nasal or pharyngeal diseases, and this is very important for the laryngeal conditions can not be relieved as long as there is any disease in the nose or

pharynx. Before making local applications the mucous membrane should be cleansed by some mild antiseptic spray, using a down-tip atomizer—then some astringent application such as chloride of zinc, ten to thirty grains to the ounce of water, or silver nitrate, ten grains to the ounce and upward. The application of silver nitrate solution to the larynx must always be done very carefully or it may set up a violent spasm of the larynx. It is wiser in nearly every application to the larynx to first spray it with a one or two per cent. cocaine solution and then wait five or ten minutes before making the stronger application. In making the application to the larynx, the patient pulls out the tongue with his left hand. The operator holds his mirror in the left hand and the applicator with the right. The applicator must be bent nearly at right angles and the short part must be from two to three inches long—otherwise it will be too short to reach the ordinary adult larynx. The cotton must be on securely and saturated with whatever solution one wishes to use but not too much so, lest some of it might be squeezed off and irritate the larynx. Now with the patient in position and breathing quietly, pass the applicator in till you come to the epiglottis, then over behind it, next raise the handle of the applicator and pass the cotton swab into the larynx. The mirror may now be taken out and the patient may close the lips if he likes. Have him breathe quietly all the time and remove the applicator while he is inhaling, then direct the patient to sit up straight, close the lips, and breathe through the nose. In this way one may often avoid any spasm of the larynx.

Do not let the patient talk for a half hour after making any application. Repeat the treatment in two or three days. The following are valuable astringent applications:

℞.
Silver nitrate twenty to sixty grains to the ounce of water.
S.—Apply on an applicator.

℞.
Antipyrin
Zinc sulphate . . . . . āā ʒ i.
Water of hamamelis
Distilled water to . . . . . ʒ ii.
Mix, and make a solution.
S.—Apply with an applicator.

Follow each application with an oil spray.

℞.
Camphor . . . . . gr. v.
Chloroform . . . . . ♏ v.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray down the throat.

At home the patient may use—

℞.
Alumnol . . . . . gr. xx.
Borolyptol . . . . . ʒ vi.
Water up to . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray down the throat three or four times a day.

The nebulizer or inhaler is especially of value in some of these cases.

℞.
Iodine . . . . . gr. x.
Potassium iodid . . . . . gr. xv.
Carbolic acid . . . . . ♏ x.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Use with compressed air once or twice daily.

℞.
Oil of caryophyllum . . . . . ♏ vi.
Terebene . . . . . ♏ xx.
Liquid petrolatum . . . . . ʒ i.
Mix, and make a solution.
S.—Use in the same way.

Another method, but more useful in acute laryngeal inflammations, is hot medicated vapors which may be combined with oxygen if necessary.

Heat the inhaler by gas or alcohol lamp up to 250° or 300° F., place four to ten drops of the medication into the receptacle and inhale for five to ten minutes twice daily.

℞.
Menthol . . . . . gr. x.
Oil of pine . . . . . ʒ i
Liquid albolene . . . . . ʒ i.
S.—Five drops in the inhaler.

℞.
Oil of tar
Tincture of benzoin co. . . . . āā ʒ i.
Mix, and make a solution.
S.—Ten drops to inhale.

After using any hot medications it is better not to go out of doors for an hour or two. If the cough is troublesome it may be controlled with small doses of soda bromide or terebene hydrate and heroine tablets. Wyeth's mentholated tablets to dissolve one in the mouth three or four times daily, are useful.

Gelatine capsules of glycerine and tannin are often very grateful to relieve irritation.

One may use powders in some forms of chronic laryngitis with good results through a powder-blower, or insufflator with the tip curved down, puffing the powder into the larynx when it is in a quiescent state. Do not have the patient say A or E as that brings the cords together and closes the larynx but let them breathe quietly and have the muscles as relaxed as possible.

Serviceable insufflations are—

℞.
Compound stearate of zinc with iodoform.
S.—Use in a powder-blower.

℞.
Iodoform
Bismuth subnitrate
Sugar of milk . . . . . āā ʒ i.
Mix, and make a powder.
S.—Use in a powder-blower.

ACUTE ŒDEMA OF THE LARYNX.

Synonyms.—Œdema of the glottis; phlegmonous laryngitis; acute cellulitis of the larynx.

Definition.—Œdema is an acute swelling due to the watery infiltration into the tissues or submucosa of the larynx.

There are many varieties of œdema but they are all practically of the same nature except the infectious form which runs a more rapid course.

The infiltration is usually serous but when the œdema assumes a more protracted form, the effusion is mixed with pus and with even a little blood.

Etiology.—The primary cause in most cases is traumatism, such as fracture of the bone causing a sudden inflammatory process. Inhalations of steam or irritating vapors of iodine, and carbolic acid. It may be caused indirectly by the inflammatory conditions in other parts of the body, such as acute tonsillitis, peritonsillar abscess, retropharyngeal abscess, or the breaking down of lymphatic glands in the sides of the neck.

The œdema in the majority of cases is secondary to another form of disease as in some form of heart disease or to the dropsical conditions of nephritis. Anything which tends to lower the state of general health predisposes to it.

Symptoms.—Acute œdema may come on very suddenly and dyspnœa may be the first symptom complained of. The voice is usually rough, deep, or may be lost altogether. There is difficulty in breathing, gradually getting worse and ending in spasms. These spasms recur every little while with more frequency, and increasing severity, until complete closure of the larynx may take place. When œdema comes on suddenly like this, it will require immediate surgical treatment. When the symptoms develop more slowly, there is pain on swallowing and a feeling as of foreign body in the throat with a constant desire to clear the throat. There is a wheezy cough but little expectoration. The suffering is usually intense, the patient

cannot lie down, and all the muscles are tense, the respiration is very harsh and the struggle for breath is very painful to witness. It is seldom possible to get a laryngeal view but when we do, we find the epiglottis red and much swollen, the arytenoid cartilages and aryepiglottidean folds are so swollen as almost to meet.

The **prognosis** will depend very much on the cause and must always be guarded—about half the cases terminate fatally.

The **treatment** will depend on the cause and severity of the case. The patient must be kept quiet in a room, the air of which is warmed and moistened by medicated vapors. The patient should be given good saline cathartic and a diaphoretic such as pilocarpine in one-eighth gr. doses hypodermatically. Cold compresses to the outside of the neck or Seiler's coil or even leeches applied to relieve the congestion. Hot astringent inhalations will often act well.

℞.
Alumnol . . . . . ʒ i.
Tincture benzoin co. . . . . ℥ i.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—ʒ i. on hot water to inhale every twenty minutes.

℞.
Tannic acid . . . . . ʒ i.
Glycerine . . . . . ℥ i.
Distilled water . . . . . ʒ i.
Mix, and make a solution.
S.—Inhale as directed.

In acute attacks, cocaine seems to be indicated. Adrenalin, by its action of contracting the bloodvessels and lessening the blood supply, may give relief.

℞.
Cocaine . . . . . gr. x.
Adrenalin (1–1000 solution) . . . . . ʒ iv.
Distilled water . . . . . ℥ ii.
Mix, and make a solution.
S.—Spray down the larynx with an atomizer with a downward tip, every hour or two.

℞.
Tannic acid . . . . . ʒ i.
Glycerine . . . . . ʒ i.
Cinnamon water . . . . . ʒ i.
Mix, and make a solution.
S.—Use in an atomizer every two hours.

When immediate relief is called for, it will be necessary to puncture or scarify the swollen parts and keep the patient in a warm room with the air moist. It may be well to follow this up with two or three astringent applications of zinc sulphate, silver nitrate or alumnol solutions. The bowels must be freely open and the skin active and moist. If the symptoms continue to increase, it will be necessary to do tracheotomy. Intubation on account of the extreme swelling would be difficult to do and the result doubtful, but in chronic cases intubation seems to promise better results. Some authors have suggested the use of tubes with the idea of dilating the parts and even coating the tube with astringents, such as alum in gelatine and repeating this with new tubes once or twice each week.

LARYNGITIS SICCA.

Definition.—Laryngitis sicca is that form of chronic laryngitis in which the glandular elements of the mucous membrane have atrophied and, as a consequence, what little secretion is formed, is so thick that it adheres to the membrane and tends to form crusts.

Etiology.—Atrophic or dry laryngitis is usually seen in conjunction with the same condition in the nose and pharynx, although it does not occur nearly as often as atrophic rhinitis. This may be due possibly to the more generous blood supply and to the less direct exposure to dust and irritation.

The irritation caused by inhaling certain gases or fumes is an important cause, as are also nearly all the general causes given under the head of chronic laryngitis.

The **symptoms** vary with the changes in the temperature

and moisture of the atmosphere. The larynx has a hot, dry appearance with more or less stringy mucus attached to different parts of it. There is usually considerable cough, due to the irritation caused by the mucus and to the efforts to dislodge it. This is noticed more in the morning for the mucus accumulates during the sleeping hours. If the cough is violent it may at times be colored with streaks of blood. The voice often has a husky sound due to the small particles of mucus that adhere to the vocal cords and prevent their coming together properly or acting as freely.

Treatment.—The chief thing is to keep the parts as clean as possible. This is best done by warm alkaline sprays of Seiler's tablets, Dobell's solution or glycothymolin.

The next step is to prevent cough by giving small doses of codeine or terebene hydrate.

It is also necessary to stimulate the glands as much as possible and this is best done by giving, night and morning, one teaspoonful of phosphate of soda in a half-glass of water

Potassium iodide in small doses, one to two grains twice daily, has a beneficial effect in some cases. Inhalations either with the globe nebulizer or good atomizer are beneficial in this form of laryngitis. Some one of the following solutions—

℞.
Iodine . . . . . gr x.
Oil of tar . . . . . ʒ ss.
Camphor . . . . . gr. x.
Liquid albolene up to . . . . . ʒ ii.
Mix, and make a solution.
S.—Use in an atomizer three or four times daily.

℞.
Menthol . . . . . gr. x.
Oil of pine . . . . . ʒ i.
Tincture benzoin co. . . . . ʒ iv.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Use in a nebulizer or spray the throat three or four times daily.

In the office, after spraying a mild cocaine solution down the larynx, make daily applications with a curved applicator using stimulating solutions, such as—

℞.
Zinc sulphate . . . . . ʒ i.
Hamamelis water . . . . . ʒ i.
Distilled water . . . . . ʒ i.

℞.
Iodine . . . . . gr. x.
Carbolic acid . . . . . ♏ x.
Camphor . . . . . gr. x.
Liquid albolene . . . . . ʒ ii.

℞.
Tincture of ferric chloride
Glycerine . . . . . āā ʒ i.
Distilled water up to . . . . . ʒ i.

At home the patient may use the following oil spray several times daily:

℞.
Iodoform . . . . . gr. ii.
Benzoinol . . . . . ʒ i.
Mix, and make a solution.
S.—Use in an atomizer three times a day.

TUBERCULOUS LARYNGITIS.

Synonyms.—Tuberculosis of the larynx; consumption of the larynx; laryngeal tuberculosis and tuberculosis of the throat.

Definition.—Tuberculous laryngitis is a specific inflammation of the laryngeal mucous membrane due to the infection and irritation of the bacillus tuberculosis.

The **pathological changes** observed in tuberculous laryngitis are a swelling or œdema of the mucous membrane due to the deposit of the bacillus tuberculosis, which causes an infiltration and softening of the membrane and finally ulceration and necrosis.

Primary tuberculosis of the larynx occurs more frequently than many authorities say. No doubt the great majority of cases are secondary to pulmonary tuberculous deposits, besides many of the cases are not seen early enough to tell which part was first affected. Some authorities speak of very early symptoms before any positive signs are to be observed. No bacilli in the sputum, but a slight weakness of the voice, rise of temperature in the evening, anæmia of the larynx or a paleness of the arytenoid cartilages, sometimes one vocal cord slightly red.

Etiology.—Any condition which tends to lower the resisting powers of the mucous membrane and make it liable to infection, if exposed in any way to the tubercle bacilli. The infection may come from the outside, causing direct infection, or indirectly by the sputum being coughed up from the lungs. Predisposition to tuberculosis—a low state of vitality such as that caused by pleurisy and pneumonia. It may be caused indirectly by obstruction to proper respiration, by spurs or deviations of the septum or adenoid growth. These may set up a catarrhal laryngitis and in this way furnish the proper surroundings for the development of the tubercle bacillus. It occurs usually between the ages of twenty and thirty-five and is seen more often in men than women.

Subjective Symptoms.—Respiration is nearly always hurried. The voice is weak, often only a whisper. There is a dry, hacking cough at first but it soon becomes looser and with a great deal of thick, tenacious expectoration, almost ropy in form. The saliva seems to be increased and the patient experiences great difficulty in keeping the throat clear. The general condition of the patient is as a rule poor, chiefly on account of his inability to take proper nourishment. If there should be any ulcerations, especially of the epiglottis, there will be considerable pain and difficulty in swallowing, and as the ulceration increases, all the symptoms gradually become more marked.

Objective Symptoms.—As a rule we notice a peculiar pale color of the mucous membrane of the larynx, especially along

the posterior wall. In some it may be hyperæmic, but hyperæmia is only seen in early stages of a very acute and rapid form.

The epiglottis is often swollen, thickened ("turban-shaped epiglottis") and the edges eroded with small ulcerations. The arytenoid cartilages are enlarged, sometimes one more than the other, the mucous membrane over them being soft and boggy. There may be considerable thickness of the membrane between the arytenoids, that is, in the interarytenoidean space. This infiltration may go on to ulceration of the peculiar worm-eaten appearance. As a rule the diagnosis of simple tuberculous laryngitis is not difficult but it may be very frequently necessary to differentiate it from syphilis or cancer, as these are the only lesions that might resemble it in any way.

The following table presents the chief points in the differential diagnosis:

Chief Symptoms for comparison	Tuberculous Laryngitis	Syphilitic Laryngitis	Cancerous Laryngitis
Condition of the Mucosa	Pale	Markedly hyperæmic almost from the onset	Hyperæmic only after ulceration
Pain	Marked during deglutition	Marked during phonation	Constant lancinating and peculiar
Ulceration	Superficial grayish worm-eaten appearance, undermined edges	Deep reddish, clean-cut, raised edges	
Stenosis	Rare	Common only after cicatrization.	Common and progressive
History	Nearly always of pulmonary tuberculosis with its physical signs	Of specific disease	None except of heredity; occurs after 40th year
Effect of Antisyphilitic Treatment	None	Pronounced and progressive	None or only very temporary

Diagnosis.—The early diagnosis is very important in the hope that by careful treatment one may be able to arrest the disease and prevent it from extending and becoming general.

The **systemic treatment of tuberculous laryngitis** is the same as of pulmonary tuberculosis and is fully described in works on general medicine. It is very important and should always be combined with local treatment. The general health should be improved in every possible way, good food, fresh air, outdoor life in a dry climate such as that of Colorado or Arizona. Tonics should be given to improve digestion and strength, cod-liver oil, creosote, guiacol, hypophosphites. Some claim good results with iodine internally. Digested fats are valuable. Patients should be encouraged to eat, even more than they desire, and should stimulate the appetite with whiskey or bitter tonics and take plenty of rest and avoid all forms of mental worry.

The **local treatment** is very important and in many cases the results are encouraging. It should be modified to suit each case and to relieve the symptoms most complained of. In the early stages some form of soothing inhalation is indicated, such as compound tincture of benzoin, oil of pine and menthol. They lessen the inflammation and irritation, and change the secretions from a thick, sticky to one more viscid and easily removed. Menthol gives very gratifying results in many cases and it may be used with a spray or nebulizer or applied directly to the membrane.

Before making local application, it is well to cleanse the mucous membrane of the pharynx and larynx with an alkaline wash or spray such as normal salt solution, Seiler's tablets, glycothymolin, alkaline thymoformal, using these solutions warm, three or four times each day.

The use of iodoform is well spoken of by some and it may be applied in solutions or in powder form.

℞.
Iodoform . . . . . ʒ i.
Ether . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray down the throat.

In using the ethereal solution, the ether evaporates quickly and leaves the iodoform in contact with the membrane. Iodoform may be used in an oily suspension but it is so little soluble that unless one uses a little chloroform or ether, very little is dissolved. It may be used in powder form combined with morphine and tannic acid. The odor of iodoform is so objectionable that it is not used as much as it should be. Upon ulcerations of the epiglottis or in arytenoid cartilages, nothing seems to act better than lactic acid in twenty-five per cent. to seventy-five per cent. solutions.

Spray the larynx with a one or two per cent cocaine solution, then apply the acid with a long applicator, holding it in position as long as possible each time. This is usually painful and should not be repeated before four or five days.

The use of the curette is advocated by some. It is difficult to do because of the irritability of the larynx and is only indicated when the ulcerations are on the posterior wall of the larynx or the interarytenoid space.

Spray the larynx with a ten per cent solution of cocaine and also apply adrenalin to control the bleeding, then pass the laryngeal curette into the larynx with the aid of a mirror and thoroughly scrape until one feels sure he has removed all the offending tissue. We have to rely very much on the sense of touch, for bleeding quickly occurs and obscures the view. After the bleeding has stopped, lactic must be applied thoroughly to the curetted surface. When the effects of the cocaine have worn off, there is usually considerable pain following the operation. The lactic acid is repeated once a week for three or four times.

Other serviceable local applications are—

℞.

Iodol		
Oil of sassafras	āā	ʒ i.
Ether		ʒ i.

Mix, and make a solution.

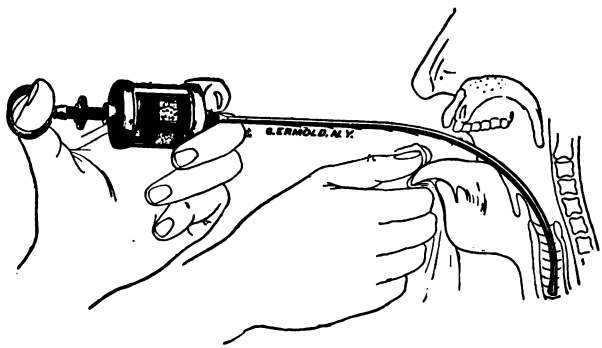
S.—Apply with an applicator or spray every two days

℞.
Orthoform . . . . . ʒ ii.
Olive oil . . . . . ʒ i.
Mix, and make an emulsion.
S.—Apply to larynx as needed.

This orthoform emulsion, applied with an applicator, will produce an anæsthesia, often lasting twenty-four hours.

Laryngeal, or intralaryngeal, injections are well spoken of by some authors. A special syringe is necessary for this, some making submucous injections, others just using it in the interarytenoid space.

Fig. 96.



Showing the syringe and the method of injection into the larynx.

℞.
Menthol . . . . . ʒ ss.
Guiacol . . . . . ʒ i.
Olive oil . . . . . ʒ ii.
Mix, and make a solution.
S.—Use ʒ i. every two days.

℞.
Creosote . . . . . ʒ ss.
Oil of gaultheria . . . . . ʒ ss.
Olive oil . . . . . ʒ i.
Mix, and make a solution.
S.—ʒ i. every two days.

The treatment by powders, although well spoken of, should be administered carefully on account of the irritability which may be set up by the powder getting down the bronchi. One of the best for relieving pain and cough is orthoform. It may be used with equal parts of bismuth subnitrate, or powdered gum acacia. Before using, the parts should be thoroughly cleansed with alkaline solution, and then sprayed with a mild cocaine solution to prevent the powder from causing cough when first applied.

Iodoform in some forms has also its advocates: compound stearate of zinc with iodoform, or,—

℞.
Morphia . . . . . gr. v.
Iodol
Bismuth subnitrate . . . . . āā ʒ i.
Mix, and make a powder.
S.—Use with a powder-blower.

The directions in using powder-blowers is that the patient must not breathe while puffing in the powder, but first take a long breath; and, while the breath is held, the operator puffs the powder down the larynx.

In tuberculous laryngitis, the Globe nebulizer or Underwood's inhaler are specially good, using one of the following prescriptions. The same prescriptions may be used with an atomizer:

℞.
Cocaine . . . . . gr. v.
Oil of pine . . . . . ʒ i.
Menthol . . . . . gr. x.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—Use in an atomizer.

℞.
Menthol
Camphol . . . . . āā gr. x.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—Use as directed.

℞.
Creosote
Oil of pine . . . . . āā ℥ i.
Tincture of benzoin co. up to . . . . . ℥ i.
Mix, and make a solution.
S.—Use as directed.

These same sprays or inhalations may be used hot, and often, in this way, will relieve pain better than any other measures.

The author prefers Underwood's inhaler, heated to 200° or 400°, with one of the foregoing mixtures, at the same time combining it with oxygen.

At home the patient will use one of the ordinary gargles, and, after having the throat well cleansed, will then employ an oil spray as far down the larynx as possible.

℞.
Cocaine . . . . . gr. v.
Oil of pine . . . . . ℥ i.
Menthol . . . . . gr. x.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—Use in oil atomizer several times each day.

℞.
Iodoform . . . . . gr. x.
Chloroform . . . . . ♏ x.
Liquid albolene . . . . . ℥ i.
Mix, and make a solution.
S.—Spray over the throat.

The **prognosis** is, as a rule, very grave, but instances of cure are reported.

SYPHILIS OF THE LARYNX.

Synonyms.—Syphilitic laryngitis; specific laryngitis.

Definition.—Syphilis of the larynx is a specific inflammation, occurring as a local manifestation of the systemic infection.

Pathology.—**Primary syphilitic lesion** of the larynx is practically unknown, the secondary and tertiary lesions being the

ones most frequently seen. The **secondary stage** is manifested by venous congestion of the laryngeal mucous membrane. This is followed by infiltration into the mucosa, and softening of the tissues, which goes on to ulceration. There may be mucous patches in conjunction with the same lesions in the pharynx. These conditions are usually found from three weeks to three months after the initial sore.

The **tertiary stage** is characterized by the presence of ulceration, which sometimes penetrates the deep tissues and blood-vessels, and causes hemorrhages. The ulcer heals and is followed by cicatricial contractions—or adhesions of adjoining tissues. This often produces great deformity and sometimes dangerous stenosis.

In the late stages, the muscles and cartilages are involved, resulting in paralysis, or ankylosis.

Syphilis of the larynx may occur at any age and be either congenital or acquired.

Etiology.—Syphilis of the larynx is usually the laryngeal manifestation of general inoculation.

The initial lesion in the larynx is almost impossible except from infected laryngeal instruments. When it is the secondary lesion, it usually follows the primary in a few weeks or months.

The tertiary is the one most frequently seen, and occurs from three years to a very long period after the primary sore.

Hereditary syphilis, when exhibited in the larynx, is almost always tertiary, so that, in all laryngeal forms, the tertiary is the one most frequently seen, though it may be years after the primary lesion has appeared. The cause, in short, is simply the local manifestations of the general specific infection, either of the hereditary or the acquired form.

Symptoms.—The symptoms vary with the form and degree of infection. In the early stages they closely resemble the symptoms of acute laryngitis. The mucous membrane has a mottled appearance, with here and there patches, which seem to be raised slightly above the surrounding tissue and

have a tendency to ulcerate. The voice is affected, becoming deep and hoarse, and, in some cases, being lost altogether. There is some pain on swallowing, and a tickling cough.

In the tertiary stage the ulcerations frequently attack the epiglottis first, and from there spread to the laryngeal cavity.

Diagnosis.—After learning the symptoms, one knows there is some laryngeal disease. Get a full history of the case, and, by the aid of the laryngeal mirror, exclude simple catarrhal inflammation, or tuberculosis.

The **secondary form** usually occurs in one of the following lesions: Erythema, superficial ulcerations, or mucus patches. The erythema usually occurs a few months after the primary sore, often shortly after the eruption on the body. It usually involves the arytenoids, epiglottis, and the false vocal cords. The superficial ulceration usually occurs in the same location, and is due to the breaking down of the mucous membrane, secondary to extreme erythema. The shape of the ulcer is characteristically irregular, with an inflammatory area around it, and with its floor sometimes covered with a grayish-yellow secretion.

The **tertiary signs** show the gumma, which may occur in the epiglottis, or the aryepiglottis fold. The pain and loss of voice are in proportion to the size of the gumma. The ulceration, which is the result of the breaking down of the gumma, is deep cut with raised edges, spreads rapidly, and has a peculiar, disagreeable odor. The ulcer spreads in every direction and often effects the bone beneath. Great destruction has often been seen, such as complete loss of the epiglottis, or of the vocal cords. In this stage the pain is severe, deglutition difficult, voice almost gone, and the general condition of the patient depreciated.

The history of the case is important. When once well satisfied, from the examination, that the trouble is specific, ask the direct question, "When did you have a venereal sore or disease?" Many patients will deny it; others will admit having had the disease ten, fifteen or twenty years previously,

and having taken medicine for five or six *weeks;* but will add that they have never had any trouble since, and that syphilis is not what is the matter with them at the time of their visit. If still in doubt, put the patient on mixed treatment for a week or ten days, and, if the disease is specific, great and immediate improvement will follow Syphilis may be mistaken for tuberculosis of the larynx; in fact, it is sometimes associated with it. The ulcer in tuberculous disease is more superficial, has not the red areola around it, and the mucous membrane is usually pale. The pain is more marked, and is usually accompanied by pulmonary signs as well.

Carcinoma is distinguished by the peculiar, sharp, lancinating pains.

The **prognosis** is usually good, as the disease responds quickly to proper medication. Often the ulceration is so extensive, that, even when a cure is effected, the loss of tissue and the resulting cicatrix will interfere a great deal with the proper functions of the parts.

Treatment.—The constitutional treatment is all important, and will cure many cases without the application of any local treatment.

In the secondary form, get the patient quickly under the influence of mercury. If any ulceration is present, thoroughly cleanse it, and make astringent applications of silver nitrate. alumnol, or sulphate of zinc solutions every other day The patient sprays the throat at home with—

℞.
Glycothymolin
Hydrogen peroxide . . . . . āā ℥ ii.
Mix, and make a solution.
S.—℥ i. in a quarter-glass of water to spray or gargle the throat four or five times each day.

In the tertiary form, iodide of potash is indicated Begin with five to fifteen grains three times each day. and add a grain per day to the dose until tolerance is reached. Pro-

tiodide of mercury pill, one-sixth grain, one three times each day, is also of service.

Make **local applications** to the ulcers of silver nitrate, ʒ i. to the ounce of water, or—

℞.
Iodol . . . . . ʒ i.
Ether . . . . . ʒ i.
Mix, and make a solution.
S.—Apply with an applicator, every two days.

Medications must be kept up, not only till all the ulceration and inflammation have gone, but also for two or three years, with a month's rest each year from treatment, in order to eradicate, if possible, the syphilitic poison.

For pain, use oil spray, such as—

℞.
Cocaine . . . . . gr. x.
Benzoinol . . . . . ʒ i.
Liquid albolene . . . . . ʒ ii.
Mix, and make a solution.
S.—Spray into the throat three or four times daily.

The principal aims of the treatment are to secure cleanliness, and to get the patient under the influence of the mercury and iodide. As a rule there will not be stenosis if the proper medication has been faithfully carried out. If stenosis has formed, it may be dilated with the ordinary laryngeal bougie, once or twice each week. If much œdema should occur at any time, it may be necessary to do a tracheotamy, but this is a rare complication.

APHONIA.

Aphonia comprises a loss of voice, or inability to use the voice above a whisper. It is nearly always a symptom of laryngeal disease.

Causes.—The usual causes of aphonia are: acute laryngitis; syphilitic laryngitis; tuberculous laryngitis; paralysis

of either vocal cord; new growths or ulcerations of any kind preventing the cords from coming together, such as papilloma, and singer's nodule.

There is still another form of aphonia, sometimes called **hysterical aphonia**, most frequently seen in females. It may be caused by a sudden shock, or great excitement.

The loss of voice is sudden, may last a few days, and recur again. The general health is good, there is no cough, an examination of the larynx shows the vocal cords normal in color, with no inflammation. An effort to phonate will cause them to come together, but they seem to have no power to remain in contact, but separate suddenly and spasmodically. The action is sometimes of a reflex character, due to nervous trouble. Bromide of soda in appropriate doses will usually effect a cure.

Diagnosis.—The diagnosis of ordinary aphonia is made with the laryngeal mirror. The treatment will depend on the cause.

PARALYSIS OF THE VOCAL CORDS.

Paralysis of the vocal cords **is caused by** an injury to either the superior laryngeal, or recurrent laryngeal nerve.

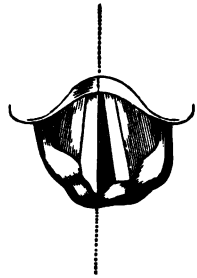
The most **common forms of paralysis of the vocal cords** are paralysis of the abductor muscles and of the adductor muscles.

Abductor paralysis is rather rare, is serious, and is usually a sequel of erysipelas, pneumonia, or typhoid fever. The muscles do not pull the cords apart, and the consequent dyspnœa may be so severe as to require tracheotomy.

Adductor paralysis is present when one or both cords do not move, during phonation, towards the median line. If both cords should remain apart during phonation, it means that paralysis of the cricoarytenoid, and the arytenoideus muscles are present. When the arytenoideus muscle only is affected, the posterior parts of the cord remain wide open, leaving a chink-like opening into the larynx.

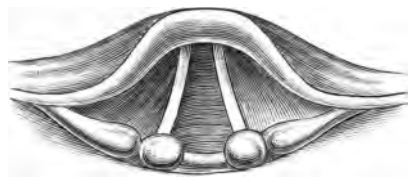
Cause.—The cause of paralysis varies in many cases, but the chief causes are acute laryngitis; using the voice during inflammation, or in a faulty manner; and pressure on the nerve,

Fig. 97.



Showing paralysis of the left vocal cord.

Fig. 98.



Showing adductor paralysis of both vocal cords.

due to traumatism, aneurysm, or enlarged bronchial glands. Paralysis may be a sequel of diphtheria, or incipient tuberculosis, or a manifestation of hysteria. Peripheral neuritis may involve the motor nerves of the larynx.

Symptoms.—Loss of voice, or a whispering, high-pitched, voice.

On examination, the larynx appears red, and, as a rule, congested. There may be little or no pain. When the patient tries to say, "A" or "E," the arytenoids (either one or both) do not come together, and, on looking farther down, one will see the condition of the cords. If only one side is affected, the other moves in a normal way—to the center, during phonation. The affected side may move in such an irregular way as not properly to approximate, and, consequently, leaves an opening, or space, during the efforts to speak. When due to hysteria, the cords will often come to the center, but, owing to lack of tone, break away at once, and apparently give every evidence of paralysis, though it is simply due to a nervous loss of muscular power.

The **prognosis** depends on the cause, but in the majority of cases is rather good.

Treatment.—The treatment depends much on the cause. In a mild case, first try counterirritation to the side of the throat, with tincture of iodine, capsicum and vaseline, or mustard leaves. Rest of the voice is indicated in nearly all cases. If there should be any indications of nervousness, bromide of soda should be given, also strychnia in increasing doses, and electricity with the faradic current, using the negative pole on the hand or back of the neck, and the positive on the sides of the larynx, or, with a specially curved electrode, apply the positive pole to the vocal cords. Static electricity is often very beneficial for its general tonic effects. It is also applied locally by means of a sponge electrode. The current, in any case, should not be too strong, and should be continued only for about five minutes every day.

The treatment is often tedious, requiring a long time and a great deal of patience. The whole sum of the treatment might be stated as—rest, strychnia, electricity and tonics to build up the general health. Iodide of potassium in small doses acts very efficienlty in many cases.

LINGUAL TONSIL.

Synonyms.—Buccal tonsil, fourth tonsil.

Definition.—The lingual tonsil **is composed of** glandular structure, situated at the base of the tongue in close relationship with the epiglottis. It closely resembles the other tonsils in structure, consisting of from ten to twenty glands which may appear in the shape of split peas spread over the base of the tongue, or may all unite, forming one large, glandular swelling. It may sometimes occur in the shape of two lobes, one on each side of the median line of the tongue. And occasionally one side may be much larger than the other.

Pathology.—The laryngeal tonsil is subject to the same pathological changes as the faucial and pharyngeal tonsil,

but the one to which attention is usually called is glandular enlargement, and the consequent symptoms it causes.

Symptoms.—The patient complains of a tickling cough and constant attempts at clearing the throat with nothing coming up. The cough is nearly always worse when the patient lies down. The voice is easily tired, and singers usually complain of the voice being thick or veiled, and easily tired. Sometimes there is a feeling of constriction about the throat. Old people will complain of nothing but cough, stating they have been taking cough medicine for years without relief.

On examination the base of the tongue is very much thickened, in some subjects in the form of many small glands like split peas, in others, one large gland which presses against the epiglottis and almost hides it from view. It is constant rubbing of the epiglottis against this increased thickness at the base of the tongue that causes the cough.

The enlargement of the lingual tonsil may be associated with the eruptive fevers, but usually it is a chronic or subacute condition (Figs. 99 and 100).

The **treatment of enlarged lingual tonsil** consists of the removal of the tissue, either with a lingual tonsillotome, or the galvanocautery. Apply cocaine well over the base of the tongue—the patient pulls the tongue forward with the thumb and finger of the left hand in the same manner as in examination of the larynx. The operator holds the mirror in his left hand and the cautery in his right. While the patient is saying, "A," the cautery tip is placed in the centre of the growth, and the heat turned on. If the amount of thickness is great, it is well to destroy one side of it one day, and the other part four or five days later. In doing this burning, the operator must be ready to remove the cautery quickly if the patient should swallow or move the tongue, in order to avoid touching the epiglottis with the hot cautery. If he should happen to burn the epiglottis, it will swell up and remain so for one or two weeks, although, if noticed in time,

FIG. 99.

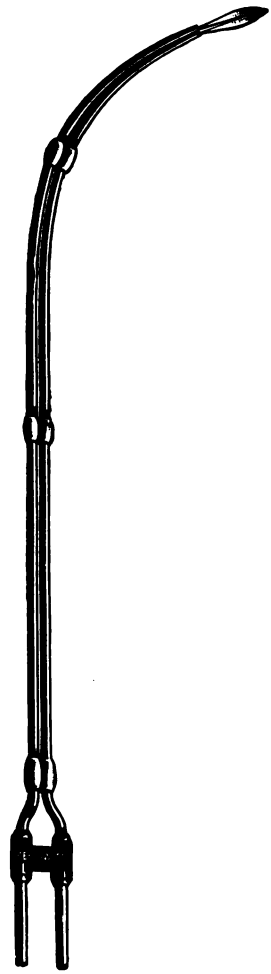


Fig. 102—Cautery point bent for burning the lnguial tonsil.

FIG. 100.

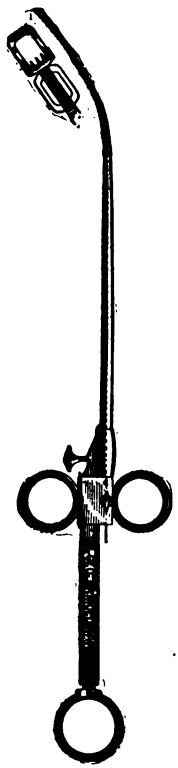


Fig. 103—Myles' lingual tonsillotome

it may be counteracted by having the patient suck pieces of ice for an hour or two.

Removal of the enlargement may be effected with a small tonsillotome made with a curved shank specially for this work. After using cocaine, cut away most of the tissue at one sitting. The bleeding, as a rule, does not amount to much, but some cases are on record in which the bleeding caused considerable alarm.

The following local application has been used with success, and is useful when the cautery or the tonsillotome can not be used.

℞

Iodine	ʒ ss.
Potassium iodide	ʒ i.
Glycerine	ʒ i.

Mix, and make a solution.

S.—Apply to the growth with an applicator.

The relief from all troublesome symptoms is quite marked, as soon as healing takes place.

No special **after treatment** is indicated, but a mouth-wash or gargle or oil spray is always soothing to the patient.

FOREIGN BODIES IN THE LARYNX.

Sources and Results.—The entrance of a foreign body into the larynx or upper air passages is often attended with most serious results. The severity of the case will depend very much on the character of the foreign body. A small article may pass through the larynx, and lodge in the bronchi, but rough, irregular bodies are much more apt to remain in the larynx. Many small, sharp-pointed objects have been known to lodge in the larynx without giving rise to many symptoms. Several cases have been reported of foreign bodies of various shapes and sizes remaining in the larynx for weeks, months, and, in some cases, years, without giving rise to much inconvenience. On the other hand, in contrast with these, we

have cases of violent spasms, and almost suffocation, caused by a crumb of bread, or a few drops of water getting into the larynx. The foreign body may enter during the act of eating, drinking, or breathing; vomited matter may enter during anæsthesia; regurgitated food may also be inspired; the contents of an abscess may be evacuated into the larynx; children often put things in their mouths, which slip into the larynx during the act of laughing or coughing.

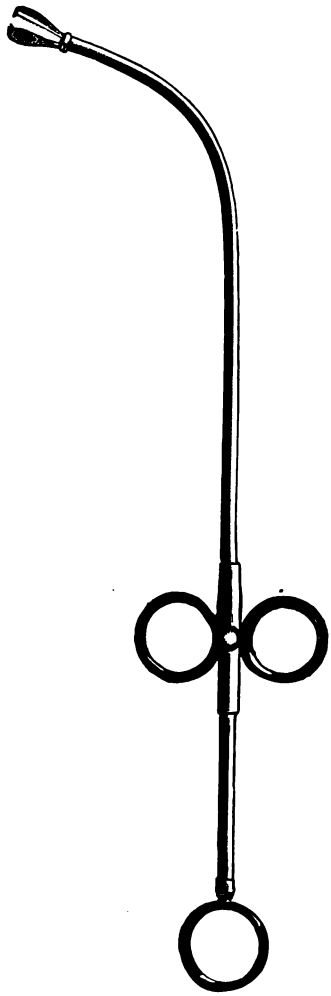
The **symptoms** come on suddenly. It is rare for any substance to get into the larynx without the patient being immediately aware of the fact, although imaginary foreign bodies form the larger majority of cases which the surgeon is called upon to treat.

The first symptom caused by a foreign body is a violent spasm of coughing which sometimes expells the object, and sometimes only tends to fasten it more securely in the membrane. If the body is large, the face becomes livid, the eyeballs protrude, and the patient quickly, or even instantly, chokes to death. If a sharp-pointed object is inspired, hemorrhage may occur, due to erosions, and, in severe cases, emphysema of the chest may occur.

The **diagnosis**, as a rule, is not difficult when one gets a clear history of the case, but in many cases the statements of patients are misleading, for they will often point with confidence to the exact spot, and, on examination, nothing can be found except perhaps a slight erosion caused by a foreign body which has either been expelled or passed further down. In every case the symptoms are urgent, and a careful examination should be made with the laryngeal mirror. If the substance should be in the œsophagus, the dyspnœa is increased by lying down.

In trying to locate a foreign body which has passed into the larynx, it is well to remember that the opening for the right bronchus is higher than the left, and that the object is more apt to get into the left than the right. If this has occurred, on using the stethoscope one will find a difference in the

FIG. 101.



Schmidt's laryngeal forceps, made with four attachments.

sounds of either lung. The effect on the breathing is so marked on the obstructed side that it is often difficult to differentiate between the sounds caused by the foreign substance and those found in pulmonary tuberculosis. When other means fail, the exact position may be determined by the use of the Roentgen rays.

The **treatment of foreign bodies in the larynx** often requires a great deal of skill. In emergency cases turn the patient quickly on his head, slapping his back and chest. No violence of any kind should be used, and emetics, as a rule, are not indicated. If these simple remedies fail in an urgent case, tracheotomy will have to be performed at once, in order to prevent the patient from choking to death, and the object may be removed afterward. In less urgent cases, where the mirror may be used and any foreign body exactly located, the obstruction may be removed by one of the various laryngeal forceps (Fig. 101); or, by passing a probang beyond the object, dilating it, and pulling it out, we may be able to get the object out.

In adult cases the use of cocaine is all that is required to control the larynx, but in children it is often necessary to give general anæsthetic.

CROUP.

Croup occurs in **two varieties**: false croup, and true croup.

False Croup..

False croup is also indicated by the **synonyms**: spurious croup; laryngitis stridulus: and spasmodic laryngitis.

The **pathogenesis** of false croup is a spasmodic contraction of the laryngeal muscles. There may be an inflammatory reaction, but, as a rule, it is very slight. This spasm causes a peculiar, hard cough and difficulty of respiration, even to the extent of dyspnœa.

Etiology.—False croup is usually seen in children of a lymphatic temperament, and more often in fat children with a short neck. Intestinal disorders are very often the indirect cause. Exposure to cold and wet is the exciting cause. Poorly nourished, rachitic children are prone to croup.

Symptoms.—False croup occurs in young children. The child goes to bed at night in apparently good health, and is awakened suddenly by a peculiar, crowing inspiration. This quickly increases in severity, with intervals of quietness. The eyeballs roll, the veins of the neck dilate, and spasms of the hands and feet may be noticed. There is no fever, but a peculiar, barking cough; and severe cases may end in a convulsion. These attacks are very terrifying to the child and parents, but, as a rule, the prognosis is good, except in weak children or in cases where there is an effusion into the ventricles of the brain. The general health may be very much affected by frequently recurring attacks.

The **treatment of false croup** is always important, and should be directed toward the general condition with the hope of warding off attacks. During an acute attack, tight clothing

should be loosened, plenty of fresh air given, cold compress applied to the face and neck, and the child placed in a warm bath while the head is kept cool. Give a purgative enema, and, if possible, use some form of emetic at once, such as tickling the fauces, a hypodermatic injection of apomorphia, or, by the mouth, a half-teaspoonful of syrup of squills or wine of ipecac every fifteen minutes, until vomiting occurs. Antipyrine, in appropriate dose, has been used successfully in many cases. The attack may last from five minutes to a half-hour, and is often very distressing but rarely dangerous. Shortly after the attack, the child is perfectly well again. It often recurs the following night, and, for that reason, it is well to keep the child quiet in the house for a few days. Give a good cathartic, correct any intestinal disorders, and, if the patient is very nervous, give a few doses of soda bromide. A stimulating expectorant, every three hours during the day time and every two hours during the early hours of the night, should be prescribed. Carbonate of ammonia is a very serviceable ingredient for this purpose. Such a cough-mixture will often prevent the recurrences which are so common for several nights following the first attack.

True Croup.

Synonym.—Membranous laryngitis.

Pathology.—True croup comprises an exudative inflammation of the mucous membrane of the upper part of the larynx, usually involving the ventricular bands, arytenoids, and the epiglottis. There is a considerable difference of opinion regarding the nature of true croup, some authorities looking upon it as a superficial inflammation of the mucous membrane while claiming that the deposit or exudation which appears on the membrane is not contagious, others considering it contagious and practically the same as laryngeal diphtheria

The **general symptoms** of membranous laryngitis and diphtheria of the larynx closely resemble each other, and the

most successful treatment in one answers equally well in the other, so that, for all practical purposes, they may be spoken of as the same.

It is always well to make a **microscopical examination** first. If the Klebs-Lœffler bacillus is found, treat it as diphtheria. It is hardly fair to expose the family to the hardships of a three weeks' quarantine, unless the bacilli are present, since the child may be well in two or three days, showing that the disease was only a simple membranous laryngitis and not a true diphtheria.

DIPHTHERIA.

Definition.—Diphtheria is an acute, infectious disease, caused by the Klebs-Lœffler bacillus and showing local manifestations by a fibrous exudate followed by general toxic symptoms.

Diagnosis.—The early diagnosis of diphtheria is often very difficult. There are several forms of inflammation, and, while the microscopical examination is very important in deciding, there are times when the Klebs-Lœffler bacillus has been found in healthy throats; on the other hand, many fatal cases have been reported in which the bacterial examination has been negative.

It is often difficult to distinguish diphtheria from acute tonsillitis. The following tabular form may be serviceable:

DIPHTHERIA	TONSILLITIS.
Comes on gradually, moderate rise of temperature, vomiting.	Comes on with a chill, rapid rise of temperature, headache, pains in the limbs.
Tonsils as a rule not large, but covered with a thick, adherent membrane.	Tonsils swollen and inflamed, covered with a false membrane not very adherent and often confined to the follicles.
Cervical glands usually swollen and painful.	Cervical glands not swollen.
Albumen in the urine.	No albumen in the urine.

DIPHTHERIA.	TONSILLITIS
The membrane is removed with difficulty, leaves a raw, bleeding surface, and, when removed, forms again in a few hours.	The membrane is easily removed, does not bleed, and seldom recurs.
The exudate is not confined to the tonsil, usually spreads over the anterior pillar and soft palate, but may be found anywhere.	The exudate is limited to the tonsil or follicles, and is usually red.
The Klebs-Lœffler bacilli are usually found.	No Klebs-Lœffler bacilli found.

The **direct cause of diphtheria** is the introduction of the specific germ. The predisposing causes are: exposure in any way to the infection; any disease which affects the mucous membrane of the nose and throat; enlarged faucial or laryngeal tonsil; cold, damp weather; unheathful hygienic surroundings; any of the exanthemata, as scarlet fever, measles. It occurs most frequently in children from two to six years of age.

The **treatment of diphtheria** must always be directed toward both the **local manifestations** and the **general constitutional effects.**

The temperature, pulse, and respiration, as well as the local symptoms in the throat, must be watched carefully and constantly. The doctor, in examining the patient, must exercise great care not to be infected himself by the patient coughing violently and some of the membrane getting in his eyes or upon his lips, or lodging in his clothes and being carried to other children. After examining a patient, he should sterilize his hands and face and all instruments. Isolate the patient at once in a well-ventilated room, in a temperature of 65° F. Remove all furniture, curtains, carpets, and similar fixtures. Have a sheet hung over the entrance in the manner of a portiere, and kept moistened with carbolic or bichloride solution. All articles used in the room, all excretions from the patient, should be disinfected before sending them out of the room. The air of the room should be kept impregnated with steam from a kettle contain-

ing some disinfectant, like eucalyptol, or carbolic acid. The following is a good prescription for such purposes:

℞.
Oil of eucalyptol . . . . . ℥ i.
Carbolic acid . . . . . ℥ i.
Oil of turpentine . . . . . ♏ viii.
Mix, and make a solution.
S.—Two tablespoonfuls to a quart of water, allowed to steam gently near the patient all the time.

The patient must be kept quiet in bed, and not allowed to rise. Nourishing liquid diet is necessary, and often stimulants. Ice-bags or cold compresses to the neck are very grateful in some cases. Allow patient to sip plenty of pure, cold water.

Local Treatment.—Some solutions have a very solvent effect on the membrane, and act very well in many cases. When the patient is old enough, and strong enough, to use a gargle, it is always well to have him use some antiseptic gargle every hour, though local applications to the affected parts always give better results. The best way to apply the solution is by means of cotton, securely fastened to an applicator, dipped in the solution, and applied to the false membrane. The cotton is then burned. The applications are repeated every half-hour as long as any false membrane remains; and, as it grows less, are given less frequently, being discontinued when the membrane does not reappear.

℞.
Toluol . . . . . ℥ iv.
Liquor of ferric sesquichloride . . . . . ℥ i.
Alcohol . . . . . ℥ ii.
Mix, and make a solution.
S.—Apply to the throat with a cotton swab.

Another application which is spoken of highly—

℞.
Menthol . . . . . ℥ i.
Guaiacol . . . . . ℥ i.
Olive oil . . . . . ℥ i.
Mix, and make a solution.
S.—Apply with a cotton applicator every two hours.

℞.
Tincture of myrrh . . . . . ʒ i.
Glycerine . . . . . ʒ i.
Distilled water . . . . . ʒ i.
Mix, and make a solution.
S.—Apply in the same manner.

Sulphocalein, applied with a cotton applicator every fifteen minutes as long as any membrane remains, has given splendid results to some men.

North says that a six per cent solution of permanganate of potassium will dissolve false membrane.

℞.
Carbolic acid . . . . . ♏ x.
Liquor of ferric subsulphate . . . . . ʒ iii.
Glycerine . . . . . ʒ i.
Distilled water up to . . . . . ʒ ii.
Mix, and make a solution.
S.—Apply with an applicator every half-hour, to one hour.

Hydrozone or hydrogen dioxide is also very useful for its disinfecting and cleansing effects. It may be sprayed with an atomizer, or applied with cotton applicator. Always have it fresh, and apply it as nearly full strength as possible. If the patient is strong enough to gargle, it is well to use it in that way, as it remains longer in contact with the membrane. In all these local applications one must use great care not to use too much force to excite or worry the patient. The patient should always use a gargle or spray for several days after the acute stage is passed. Normal salt solution, saturated boric acid solution, or remedies of this type are recommended.

Internal medication is very imperative in this disease. Nourishing food, in soft or liquid form, must be taken regularly,—milk, ice cream, custards, soups, etc. If the strength begins to grow less, stimulants should be taken,—whiskey, and sherry wine. If the patient is unable to swallow, stimulation and nourishment in the shape of peptonized food, etc., should be injected into the bowels, using a long, soft catheter. Tonics are very necessary, such as tincture of chloride of iron, four

to ten drops every hour, calomel, a half to one grain every hour, until the bowels move freely. These then should be kept up at longer intervals. If the heart shows any signs of weakness, strychnia, digitalis, and brandy should be used in appropriate doses and at very short intervals.

In **true diphtheria of the larynx**, the patient should be kept in a room in which the atmosphere is moist. This is best effected by having a stove in the room, with a good fire, and having large vessels of water on the stove, thus keeping the room saturated with steam.

A large lump of lime placed in a bucket and water poured over it, will give off much disinfecting steam. Cover the patient's bed or cot with a tent or sheet, and let him inhale, five to ten minutes every hour, the steam from a croup-kettle or benzoinol inhaler, using carbolic acid and eucalyptol turpentine, or tincture benzoin. Calomel, both internally and externally, is very useful.

Volatilize from five to fifteen grains of calomel every two or three hours for twenty-four hours in a small dish over a spirit-lamp, using the same form of tent or sheet as in the other inhalations.

In all the inhalations and fumigations, be careful to admit plenty of fresh air. These procedures were very successful before the introduction of antitoxin.

Rooms occupied by diphtheria patients must always be thoroughly fumigated with sulphur, as soon as the patient has recovered.

In some of the severe laryngeal cases, intubation or tracheotomy may be necessary to save the patient's life.

Intubation is Indicated.—When the voice becomes whispering, or suppressed; when the dyspnœa becomes marked, both in inspiration and expiration, and when there is considerable recession at the base of the sternum along the intercostal spaces.

Do not wait too long after the diagnosis to establish by bacteriological examination. Much effort to overcome diffi-

culties in intubation should not be used nor continued long at a time, and if relief is not attained soon after the tube is in place, tracheotomy should be resorted to. The technic of intubation and tracheotomy as a means of treatment will be described in a special chapter.

The **treatment of diphtheria by antitoxin, or the serum treatment**, as it is called by some, promises the best results, and, judging by the increased amount of it being used each year and the great decrease in the mortality of this dread disease, it certainly should commend itself to every physician who happens to be called to treat diphtheria.

The benefit to be derived from the antitoxin injection depends largely upon the time of its being used. If three or four days have elapsed and the disease has made rapid progress, both in the extent of the local manifestation and also of the general constitutional effects, the hope of saving is not very bright; but, even in a case like that, the injection should be used at once in the hope of benefiting the patient even slightly.

When called in the early stages to see a case of diphtheria, the physician should inject at once 2000 units, and, if the conditions are not better in six hours, the injection should be repeated; but if they have improved, wait twelve hours; then give 2000 more, and repeat this again in from twelve to eighteen hours. Usually three injections are sufficient, but as high as five may be given. If any other children have been exposed inject 1000 to 1500 units as **a prophylactic measure.**

A sign of improvement is a bright red line surrounding the diphtheritic patch and a healthier condition of the surrounding tissue.

The effect of the serum is to lower the temperature. The injections are usually made in the side of the abdomen or of the large muscles of the back, and all antiseptic precautions must be used, both in cleansing the skin and having the syringe clean.

Antitoxin should be given in every case when the diagnosis is doubtful. If the larynx is at all involved, it should be used at

once. By this policy of treatment, a great deal of time is saved if the disease is diphtheria, and no harm at all is done if it is not diphtheria. Early injection is most important, and the sooner it is done after diagnosis is made, the better, but good results have occasionally been attained three days after the onset.

Slight oedema may occur at the point of injection, and urticaria-like eruptions have been observed in many cases—albuminuria in some few—but these symptoms all disappear in a few days.

A few fatal cases have been reported as due to the injection but whether due to any injection which may have been in the antitoxin or to the infection being made directly into a vein, has not been stated. In all cases it is well to use all antiseptic precautions. Be careful not to inject into a vein, and, above all, be absolutely sure that the antitoxin it thoroughly pure.

NEW GROWTHS OF THE LARYNX.

New growths of the larynx may be divided into **two varieties**:—benign and malignant.

The **benign new growths of the larynx** are:—Papilloma, fifroma, anglioma, and myxoma.

The **malignant new growths of the larynx** are carcinoma, and sarcoma.

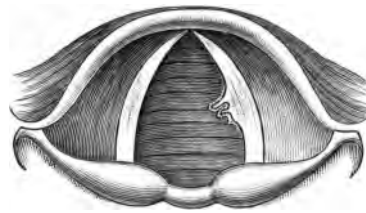
PAPILLOMA OF THE LARYNX.

Papilloma of the Larynx is the growth most frequently seen. Papillomata vary much in size and physical appearance. The color is usually a light red, the size varies from that of a pin-point to a bean, and there may be one, or several. Sometimes they look firm and round; at other times they resemble wart-like growths. They are most common in adult life. The papillomata sometimes found in children are peculiar in that they

are soft, multiple, and usually associated with nasal or pharyngeal, catarrh. They are extremely hard to remove on account of the difficulty in keeping the child quiet and in a good light to view the growth, and on account of the smallness of the space.

Papillomata may develop in any part of the larynx, but usually they are found on the vocal cords, ventricular bands, and the aryepiglottidean folds.

FIG. 102.



Papillomata of the left vocal cord.

A guarded **prognosis** should always be given, on account of the difficulty of removal and the tendency to return, but more especially on account of the tendency of the growth to become malignant if subject to much irritation.

FIBROMA OF THE LARYNX.

Fibroma of the larynx is possibly the next most frequent growth, and, like the papilloma, usually grows from the anterior extremity of the ventricular bands. Fibroma consists of hard, dense, fibrous tissue, grayish or deep-red color. The size varies from that of a pin-head to one large enough to almost fill the larynx.

Removal is followed by good results, for the growth seldom recurs.

Symptoms.—The symptoms of benign growths of the larynx will depend on the size and position of the growths. When

they occur in the vocal band, the voice is interfered with, a condition which may develop complete aphonia. In adults they are usually easily removed, but in children it is very difficult to get at them, and, if irritated much by unskilled attempts, they may increase rapidly in size, and may become malignant.

Treatment in Children.—If the growth is not too large, very good results may sometimes be obtained by using intubation tubes, with a specially prepared solution of alum, which forms a coating over the tube, and, placed in the larynx, acts as a strong astringent.

As a rule, however, in children, it will be better to perform a preliminary tracheotomy, and then remove the growths with forceps; or, by cutting through the thyroid cartilages, remove all the growths at once. As soon as healing takes place, remove the tracheotomy tube.

Treatment in adults is much simpler. Spray the larynx with two per cent. cocaine, and afterward apply ten per cent. thoroughly over the larynx. With the aid of the laryngeal mirror, one may now see the exact condition of the larynx, and then select his instrument for operating (Figs. 106 and 107).

If the growth is a large one, it can best be removed by forceps, using one to suit the size of the larynx. If the growth should happen to be situated at the sides of the vocal cord, with more or less of a pedicle, it may easily be removed with the snap guillotine. If the growth is small, or in a position hard to remove by forceps, it may be removed or reduced in size with chromic acid fused on an applicator with nitrate of silver, applied in the same way, or with a long cautery-electrode. In all these operations great care must be used for fear of wounding the surrounding part, particular care being exercised in the use of cauteries.

When operating on the larynx, one should always be prepared to perform tracheotomy in case of spasm of the glottis. After the growths have been removed, it is always well to keep the patient under observation for some time, and have

him use at home every day an astringent spray to the larynx, using an atomizer with a down tip, so as to reach the larnyx thoroughly.

FIG. 103.

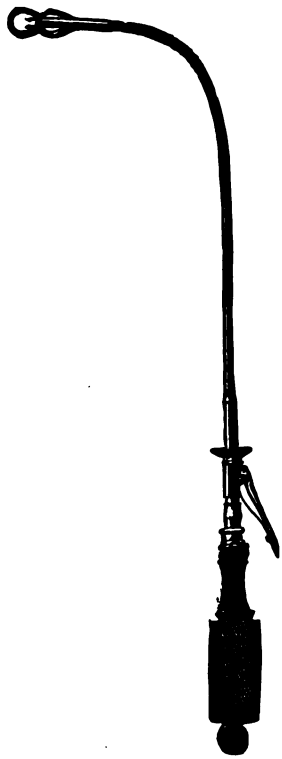


Fig. 103—Snap guillotome, for removing a laryngeal growth.

FIG. 104.

Fig. 104—Forceps for removing a laryngeal growth.

℞
Alumni . . . . . gr. x.
Benzoinol . . . . . gr. x.
Distilled water . . . . . ℥ iv.
Mix, and make a solution.

Or—

℞
Adrenalin . . . . . ♏ x.
Zinc sulphate . . . . . gr. ii.
Distilled water . . . . . ℥ iii.
Mix, and make a solution.
S.—Use either one of these in an atomizer daily for a few weeks, and follow it with some soothing oil application, such as—

℞
Aristol . . . . . gr. x.
Menthol . . . . . gr. v.
Benzoinol . . . . . ℥ ii.
Mix, and make a solution.
S.—Spray into the throat daily.

MALIGNANT GROWTHS OF THE LARYNX.

Malignant tumors of the larynx are **not uncommon** and they may be classed under **two types**,—carcinoma and sarcoma.

CARCINOMA OF THE LARYNX.

Carcinoma of the larynx, **commonly called** cancer, is the most frequent growth and is usually of the epithelial variety.

The **etiology** of these growths is still rather uncertain, and no positively definite cause may be given. Heredity is an important factor, and any position or habit that causes constant irritation to the mucous membrane, such as smoking, or irritating fumes of any kind, may result in changing a simple growth into a malignant one. It is more frequently seen in men than in women, and usually occurs at about the middle period of life.

Carcinoma of the larynx may attack any part of the larynx, but is usually found on the epiglottis, the aryepiglottidean fold, or the vocal bands.

In the **early stages** there may be some difficulty in the distinction of carcinoma from ordinary papilloma. One of the best evidences of carcinoma is the general infiltration around the growth, and the tendency to extend backward.

In the later stages, when ulceration has taken place, the diagnosis is more easy; fungoid growths are seen sprouting from the surface of the ulcer; all the surrounding tissues are inflamed; and, as the cancer extends, the cartilages become involved, and much deformity may appear.

One of the most important **symptoms** is the peculiar lancinating pain radiating towards the ears. As the ulceration increases the pain gradually augments. The voice is affected and in some cases completely destroyed. The cough depends on the amount of ulceration. Dyspnœa occurs, gradually getting worse, due to the amount of ulceration and infiltration into the surrounding tissues. Swallowing is painful and difficult, especially if the upper part of the larynx is affected. There is a great deal of salivation, mixed at times with a mucopurulent secretion from the ulceration.

The **diagnosis** is often difficult, and one may have to differentiate carcinoma from ordinary papilloma, or from tuberculous and syphilitic laryngitis. It is very important to exclude these before the diagnosis is certain.

Papilloma occurs usually in early life, cancer, after middle age. Papilloma is more clearly defined as a tumor, while cancer presents more irregularity and infiltration. In cancer, the pain radiating toward the ear is very significant, and the glands in the vicinity are usually enlarged. In tuberculosis one is apt to find the characteristic cough and the usual pulmonary lesions. Syphilis is more difficult to differentiate, especially if a gumma, but the effect of iodides on a syphilitic lesion will usually confirm the diagnosis. When still in doubt, in fact, in all cases,—a small part may be cut off and a micro-

scopical examination will usually decide the nature of the growth. In the early stages of cancer, the most significant sign of its existence is the gradually increasing hoarseness. A lesion or small ulceration, on one side of the larynx, and thickening of the surrounding tissue will cause more or less loss of motion on the affected side. These symptoms and conditions also have a tendency to increase.

The **prognosis** is, as a rule, unfavorable; but, when seen early and thoroughly removed, there is a fair chance of recovery. It is exceedingly difficult, however, to remove the growth completely, and recurrence is very common.

The **treatment** may be divided into two parts,—operative and palliative. Iodide of potassium is one of the most useful drugs in these cases, even when the diagnosis is certain. It is well to put the patient on small doses for a time, and often marked improvement will be noticed; but it does not continue, and in two or three weeks all improvement will cease.

The **palliative treatment** consists in the use of soothing sprays and oils.

The **operative measures** include laryngotomy, with the removal of the growth, and laryngectomy.

SARCOMA OF THE LARYNX.

Sarcomata of the larynx are rare and may attain great size. They differ widely in appearance, and may resemble a papillowa or fibrona. A microscopical examination is often the only means of making the diagnosis. They are usually found involving the true or false vocal cords. The tumor at first is usually round, smooth, generally red in color, but darker than the surrounding tissue. When ulceration takes place, and the growth is spreading rapidly, it is difficult to distinguish it from carcinoma. They do not kill as quickly as carcinoma, and usually terminate fatally. The only hope of recovery is the early and complete removal by operation.

SINGERS' NODULES.

Singers' nodules **are defined** as another form of growth seen in the larynx but confined to the vocal cords.

Synonyms.—Trachoma of the larynx; chorditis; tuberosa.

Pathology.—The nodule is a small growth due to some inflammatory action, usually seen near the edge of the cord nearer the anterior than the posterior end. There may be more than one, sometimes one on each cord. They vary in size from a pin-point to as large as a pea. The most frequent cause is the improper manner of using the voice in not adopting the proper method of producing tones,—singing with the muscles in a tense position; or singing while suffering with a slight cold, thus using the vocal cords while the surrounding tissues are more or less inflamed. It may also be caused by any sudden and violent use of the voice,—a small vessel in the cords being ruptured and swelling up in inflammatory condition.

Symptoms.—There is always alteration in the voice, variable in extent, due to the amount of interference with the approximation of the cords. The voice is uncertain, and will often act in a very uncertain way. People who used to sing find that they have difficulty in using their voice, usually in the middle register, but quite often in the upper; the voice seems to break suddenly, and lacks its former carrying power. These conditions gradually get worse as the growth increases in size, until complete loss of voice may occur.

The **diagnosis** is very easily made with the laryngeal mirror.

The **prognosis** depends entirely on the ability to remove these growths.

Treatment.—Use cocaine freely. If the nodules are large it may be possible to seize hold of them with a laryngeal forcep, but as they are abundant in dense tissue, this is hard to do. It is usually better to shrink them with caustic, using either chromic acid on a guarded applicator, or a long cautery-electrode. This latter the author finds best: it may be

applied to exactly the center of the growth, and the heat is under better control than in any other way.

After any of the foregoing treatments, the patient should use the voice but very little during the next thirty-six or forty-eight hours. An astringent spray is indicated in the aftertreatment.

In mild cases, cure may be effected by directing the patient to stop using the voice for a week or two, the sending him to a proper teacher, so that he will learn to use his voice in the proper manner. At the same time he should use—

℞.
Alumnol . . . . . ʒ i.
Glycothmolyin . . . . . ʒ iv.
Distilled water up to . . . . . ℥ iv.
Mix, and make a solution.
S.—Use an atomizer with a down tip for larynx.

And follow it with an oil spray—

℞.
Camphor . . . . . gr. x.
Zinc sulphate . . . . . gr. xx.
Liquid albolene . . . . . ℥ ii.
Mix, and make a solution.
S.—Use in an oil atomizer.

In many simple cases this is all that will be required.

QUESTIONS.

Describe the larynx.
How many cartilages are there in the larynx? Name them.
Name the adductor and abductor muscles of the larynx.
Name the arterial and nervous supply of the larynx.
What are the ventricular bands? Describe them.
Describe the true and false vocal cords.
What is laryngoscopy?
Describe the method of examining the larynx.
What difficulties in examining the larynx may sometimes be met, and how would you overcome them?
What do you see in the normal larynx?
Name the disease most commonly found in the larynx.
What is acute laryngitis? What is the etiology of it?

What are the symptoms of acute laryngitis?

Describe the conditions found in examining an adult larynx with acute laryngitis.

How would you diagnose and treat acute laryngitis in a child?

What is chronic laryngitis, and why is it called such?

Give the etiology and symptoms of chronic laryngitis.

Describe the condition found on examining the throat in chronic laryngitis.

Give fully your method of treating chronic laryngitis.

What is meant by œdema of the larynx, and by what other name is it sometimes called?

What is the cause of œdema of the larynx, and how would you treat it?

What is laryngitis sicca? Describe the conditions found in the larynx in this disease.

What would be your method of treating a case of laryngitis sicca?

Give the pathology of syphilitic laryngitis.

Give fully your method of diagnosing a case, and state how you would differentiate it from tuberculosis, or cancerous conditions.

Describe your method of treating a case of tertiary syphilis of the larynx.

How would you diagnose a case of tuberculous laryngitis?

What might it be mistaken for, and how would you differentiate it?

What is the usual prognosis in tuberculous laryngitis, and why?

How would you treat tuberculous laryngitis in the early stages before ulceration took place?

How would you diagnose and treat tuberculous ulceration of the larynx?

What is the lingual tonsil?

How would you diagnose a case of enlarged lingual tonsil?

What are the symptoms usually complained of, and how would you treat a case of enlarged lingual tonsil?

What do you mean by false croup, and how would you diagnose a case of it?

What is true croup, and how would you diagnose it from false?

How would you treat a case of true croup?

What is aphonia, and what are the usual causes of it?

What do you mean by paralysis of the vocal cords?

How would you diagnose a case? Describe the conditions usually found in the larynx when paralysis exists?

What is the prognosis in paralysis of the vocal cords, and how would you treat a case of it?

What are the symptoms of foreign body in the larynx? Outline fully your treatment of a case.

What growths are found in the larynx?

What are the symptoms, and how would you differentiate malignant growths from benign ones?

How would you treat a case of papilloma of the vocal cords, and what is the usual prognosis?

How would you diagnose a case of papillomata of the larynx in a child, and how would you treat it?
What is diphtheria?
For what diseases might diphtheria be mistaken?
Describe fully the subjective symptoms of diphtheria.[1]
How would you differentiate diphtheria from acute tonsillitis?
How would you treat a case of suspected diphtheria?
What precautionary measures would you take in a family where one child had diphtheria?
Outline your treatment in a case of diphtheria.
Explain fully how and when you would use antitoxin?
When is intubation indicated in diphtheria.
What is intubation, and when is the operation indicated?

CHAPTER VII.

TRACHEOTOMY AND INTUBATION.

TRACHEOTOMY.

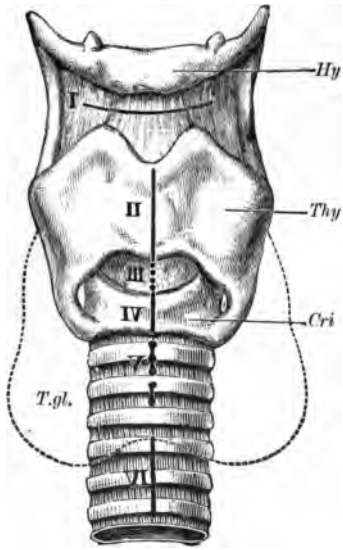
Definitions and Varieties.—Tracheotomy opens the trachea for the admission of air, and is given different names according to the location of the incision: thyrotomy, laryngotomy cricotomy, tracheotomy (high tracheotomy or low tracheotomy).

The **instruments for tracheotomy** are two scalpels, artery forceps, tenaculum, blunt hook, scissors, small retractors, needles, tracheotomy tube, tape, tracheal dilator (Fig. 105).

Tracheotomy is indicated in diphtheria when intubation does not relieve and the symptoms are urgent; to remove foreign bodies from the larynx that cannot be treated by simple methods; to provide passage for air, in growths, tumors, or abscesses pressing on the larynx and interfering with the proper supply of air; and for œdema of the glottis when the intubation tube cannot be introduced.

Choice of Form of Tracheotomy.—When possible, select the operation below the larynx. It is preferable to cricothyrotomy. While the latter is easier, the parts being nearer the surface, the lower operation is more easily performed in adults, and is more advisable if the tube is to be worn for any length of time. In all cases the site of the operation is decided by the cause and the object to be attained.

FIG. 105.



Operations on the larynx and trachea: I, subhyoid pharyngotomy; II, thyrotomy; III, laryngotomy; IV, crieotomy; V and VI, high and low tracheotomy; *Hy*, hyoid bone; *Thy*, thyroid cartilage; *Cri*, cricoid cartilage; *T.gl.*, thyroid gland.

Technic of Tracheotomy.—Fig. 106 shows the best position of the child. The patient is placed upon the back near the right side of the table, with a firm support under the shoulders. This position renders the structures on the anterior surface of the neck tense. The trachea is brought forward and the superficial veins are partially emptied Chloroform is a good anæsthetic, unless contraindicated by pulmonary lesions. Ether may be used. In some adults, who are not nervous, the operation may easily be done under cocaine, injecting it under the skin and getting good local anæsthesia. The one giving the anæsthetic should hold the head steadily in position and exactly in the median line. This is important, as it affects very much the exact line of the incision. Before making the incision locate exactly the thyroid and cricoid cartilages and the median line of the neck. The incision should be made from a level of the cricoid cartilage downward for about one inch and a half.

The subcutaneous tissue and cervical fascia should be separated with the handle of the scalpel. Cut carefully until the sternohyoid and sternothyroid muscles are reached. In the space between these muscles, the trachea is seen crossed just below the cricoid cartilage, by the isthmus of the thyroid

FIG. 106.

Position of patient for tracheotomy.

gland. Cut transversely the suspensory ligament of the thyroid isthmus (deep cervical fascia extending from the cricoid cartilage and enveloping the isthmus) and push the isthmus downward for the extent of two or three tracheal rings. Everything is now bare to the trachea. Locate the exact position of the cricoid and the median line, and carefully stop all bleeding. Everything is now ready for the operator to open the trachea. All instruments should be at hand in order to do it quickly,—a sharp scalpel tenaculum, tracheal dilator, damp towel, and the tube. The tenaculum is now hooked into the cricoid cartilage, held exactly in position, and pulled gently upward. From the moment the hook is in the cricoid it acts as an irritant, and will often cause reflex cough. As soon as the trachea is opened there may be violent cough, forcing out the blood and mucus that might happen to be in the larynx. Care must be taken not

to get this sputum into the eyes of the operator, and for that purpose the damp towel is used. When the tube is in place and fastened by the tape around the neck, the lower part of the skin incision may be closed by three or four sutures. A piece of gauze is placed between the bute and the skin, and another thin piece of damp gauze protects the opening of the tube, and helps to moisten the air as it enters the lungs. The patient is kept quiet in bed, and the temperature of the room is maintained at from 75° to 80°. The nurse should see that the tube does not become stopped by mucus, for during the first twelve to twenty-four hours the tube acts more or less as an irritant, and requires constant care to prevent it from being blocked by the increased amount of secretions. The air of the room is kept moist by steam with some antiseptic added. (Figs. 107 and 108.)

FIG. 107. FIG. 108

Tracheotomy tube, showing the outer and inner parts.

Removal of the Tracheotomy Tube.—The inner tube may be taken out often and cleansed, and the outer tube about once

each week. The length of time to leave the tube in place depends upon the object to be attained.

If the object is to recover a foreign body, the tube is taken out as soon as the irritation caused by the foreign body is gone.

In diphtheria it may be removed in from ten to fifteen days. It may be worn for years if necessary. Before removing the tube permanently, it is well to close it with a cork for a part of each day, thus permitting the patient to practice breathing through the nose.

The tracheal wound heals very quickly by granulation as soon as the tube has been removed.

Indications and Choice of Site of Operation in Emergency Tracheotomy.—Opening the neck, in cases of emergency, is sometimes required. This is always more difficult in children than in adults, on account of the small space in which to operate.

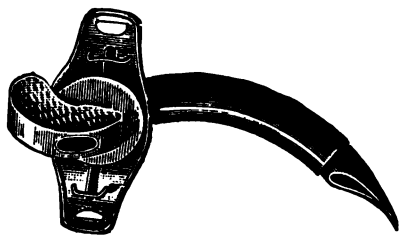
In children it is often quite difficult to open the trachea rapidly, on account of the smallness of the tracheal rings which may easily be broken by pressure. On this account opening the larynx is the more suitable operation, when it is urgently required to relieve the danger of a foreign body, etc. It is not a good opening if a tube has to be worn for any length of time. An opening is made *in the cricothyriod space*, which in children is always very small.

The position of the patient, and the instruments necessary are the same as in tracheotomy, only the opening is a little higher up, beginning at the lower part of the thyroid cartilage and extending downward, in the median line, to the cricoid.

The cricothyroid membrane is exposed, and opened by a vertical incision cutting directly into the larynx. One cannot stop to arrest the bleeding, but will have to control it as much as possible to prevent it from entering the larynx If no tube is at hand the opening may be held open by forceps or tenaculum. As soon as the opening is made and air enters, the congestion of the bloodvessels is relieved. (Fig. 109.) There are emergency tracheotomy tubes that may be used to plunge directly

into the larynx or trachea, in case a person is in great danger of choking. They are made on the same principle as an ordinary trocar: but care must be taken not to plunge them too far, for fear of wounding the posterior wall of the trachea or larynx. Never allow the patient to die when an opening into the trachea or larynx might save his life. Even if only a scalpel or ordinary pen-knife is at hand, make an opening at once, and rotate the blade crosswise in order to hold the wound open. This is easily done in adults, the points to be remembered being, to have the patient flat on the back, shoulders raised, and head held steadily in the median line. Locate the cricoid cartilage, and make the incision exactly in the median line. If one has no tube, hold the incision open with tenaculum, or put in a goose-quill, or anything that will hold the opening wide and allow the air to enter. As soon as the danger has passed and the tube or quill is removed, the wound heals precisely as do the ordinary tracheotomy wounds.

FIG. 109.



An emergency tracheotomy tube.

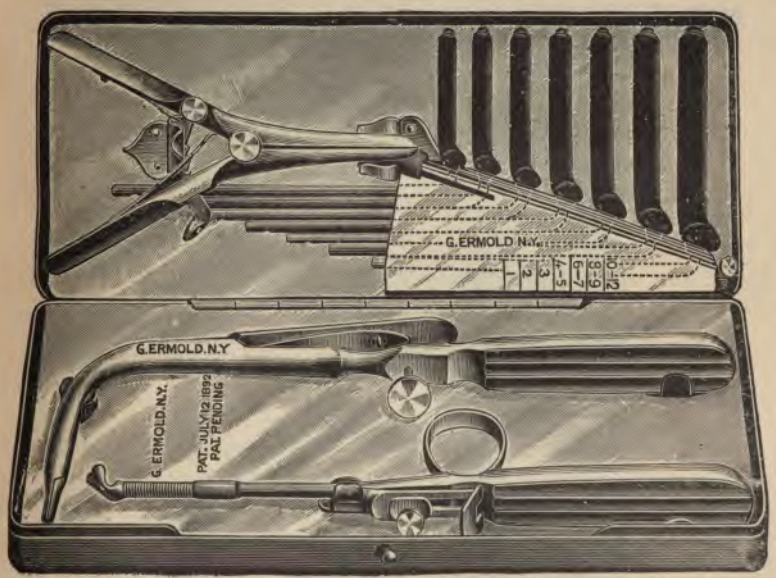
INTUBATION.

Intubation comprises the act of placing a hollow tube in the larynx to allow the air to enter the lungs. The tube lies between the vocal cords; with the head of it resting upon the false cords (Fig. 110).

Intubation is indicated in any obstruction of the larynx which prevents a sufficient amount of air from entering the lungs, such as croup, œdema of the glottis, spasm of the larynx, any form of paralysis that lessens the lumen of the larynx, chronic stenosis. Intubation is not indicated for the

removal of a foreign body, nor for any obstruction too far down to be reached by the shaft of the tube. This operation of intubation, and the instruments, were first devised and described by O'Dwyer. His original instruments have been modified, but still remain as serviceable as any others.

FIG. 110.



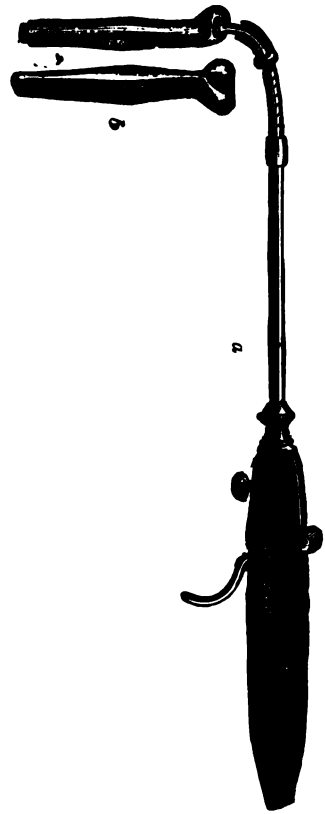
O'Dwyer's intubation set.

The technic of intubation and extubation is of two stages, placing the tube in the larynx (intubation), and removing the larynx (extubation).

The Technic of Intubation.—The child is placed upon a nurse's knee, a sheet or towel is pinned around its arms, its head is held against the left shoulder of the nurse firmly by one hand; an assistant stands at one side, holding the mouth-gag in position, and pulling the tongue out gently, exactly in

the median line; the operator holds the introducer, carrying the proper size tube, (to which a string has been attached), in his right hand; passes the forefinger of the left hand into the mouth until the epiglottis is encountered, and pulls it gently downward; with the right hand passes the tube in, keeping it exactly in the median line; as soon as the epiglottis is reached, raises the handle of the carrier; and the tube slips over the epiglottis, into the larynx (Fig. 111).

Fig. 111.



O'Dwyer's laryngeal tube and introducer.

As soon as one feels it in position, he presses the spring of the carrier, which loosens the tube. Keep the finger on the head of the tube, and draw out the introducer, leaving the tube in place. In two or three minutes the spasm from the irritation of the tube passes, and the child quiets and breathes more easily. The string attached to the tube may be fastened to the side of the cheek with a strip of adhesive plaster, or fastened to the teeth, and after the danger of spasm or coughing it up, the string may be removed and the tube allowed to remain any length of time.

Dangers of Intubation.—1. One of the most serious hazards is the collapse of the patient from the repeated attempts to introduce the tube in an unskillful manner,—heart weakness in diphtheria is very common.

2. The tube may be too small and slip between the vocal cords.

3. The tube may be forced into the wrong passage; i. e., the œsophagus.

Fig. 112.

Position for feeding a case of intubation of the larynx.

4. The tube may push ahead of itself some of the membrane, and in this way obstruct its own lumen, or infect the lower regions of the larynx.

5. The tube may be forced up by coughing or vomiting.

6. The child may pull the string out, or bite it off with the teeth.

7. If at any time there is sudden dyspnœa, the nurse should take the tube out, and, placing the child with head down, vigorously slap it on the back.

8. In feeding the child, care should be exercised lest food get into the trachea. The best method of feeding is to let the child swallow the food while lying on the back, or side, with the head a little low (Fig. 112).

In diphtheria, if antitoxin has not been used before the tube was introduced, give it at once; and, if there is any tendency

FIG. 113.

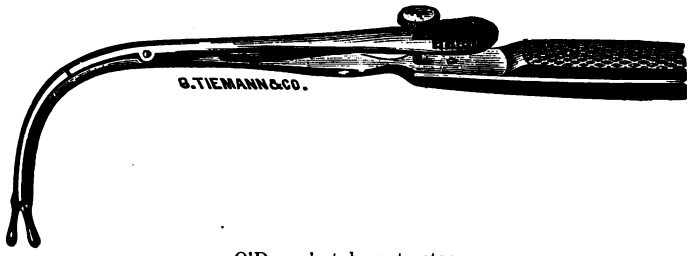
Intubation of the larynx.

for the membrane to extend toward the trachea, as shown by the quickened respiration, crowd the antitoxin, giving heroic injections (Fig. 113).

The **technic of extubation** is more difficult, but is done in

the same general way, except that the extractor is in the shape of a forceps which fits into the opening of the tube; by pressure on a spring, the jaws open, and fasten to the tube and in this way it is removed (Fig. 114).

FIG. 114.



O'Dwyer's tube extractor.

The tube may sometimes be removed by placing the fingers on each side of the trachea, causing the patient to cough and in this way forcing it out.

Extubation is a difficult operation in a struggling child, and should be done quickly, using no force whatever. When done in this way extubation has very few unpleasant consequences to the child.

Every physician should practice on the cadaver, and become familiar with the technic of the operation. **Duration of retention of the tube.** The length of time for leaving the tube in the larynx will depend on the size of the child and the severity of the case. In young children with diphtheria, it may require a long time, but when the case is doing well, it will seldom require to be left in more than six or eight days, and when then removed, will rarely require to be replaced.

The tube should always be removed and examined on the occurrence of any dyspnœa, for the tube may have become filled with mucus or shreds of membrane.

An evidence that the tube is in position and not occluded is the character of the breathing in the lungs, which should always be ascertained by careful auscultation.

After the removal of the tube, always remain at the bedside for an hour or two, and, if dyspnœa returns, replace the tube at once. There may be erosions or paralysis after the removal of the tube but these things soon pass away.

QUESTIONS.

Explain the steps taken in intubating a child.
What are the dangers sometimes seen in intubation?
How long would you leave the tube in, and when would you consider it safe to leave the tube out?
What is tracheotomy?
What instruments are necessary for the operation?
Describe the operation for tracheotomy.
What dangers are to be avoided in performing tracheotomy?
Describe fully the care and aftertreatment in a case of tracheotomy.
How long may the tube be worn?

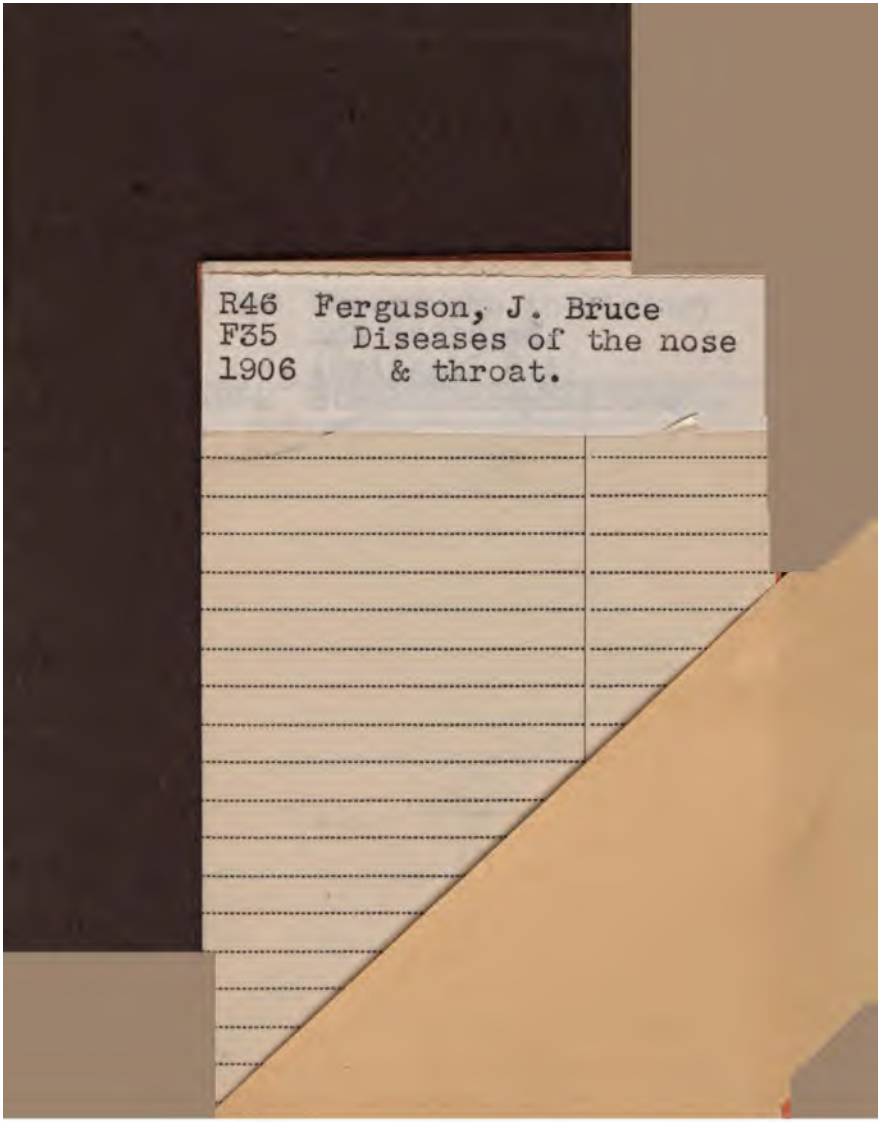
INDEX.

S

T

U

V


R46 Ferguson, J. Bruce
F35 Diseases of the nose
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